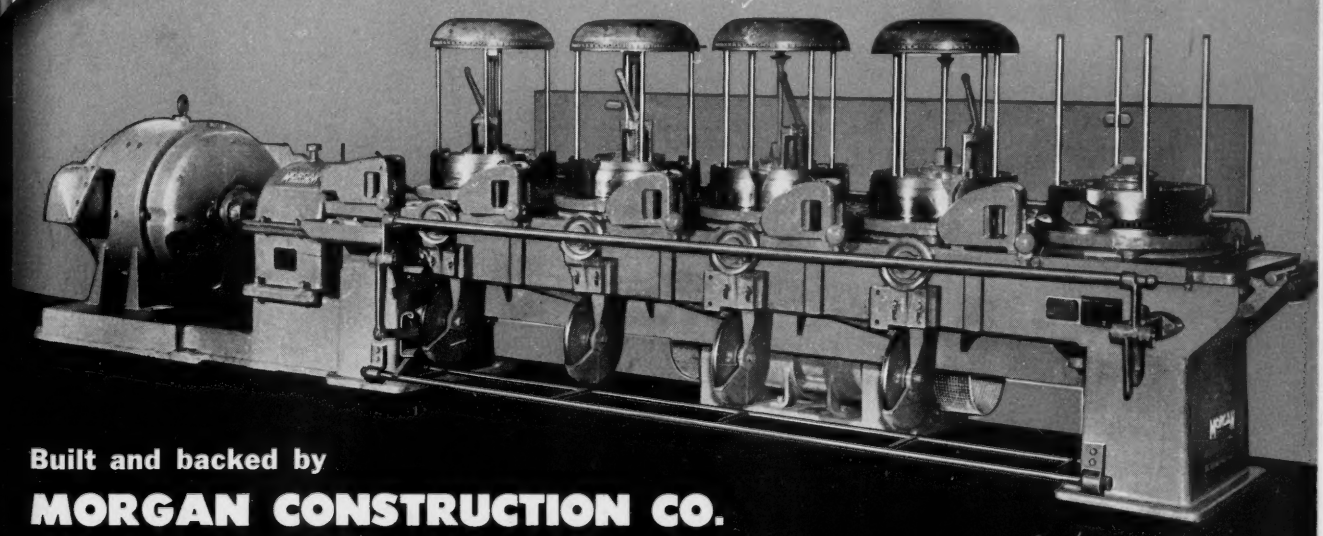
WIRE AND WIRE PRODUCTS

JUNE 1947

To Cost Conscious Mill Operators:

Investigate

MORGAN-CONNOR WIRE MACHINES



Built and backed by

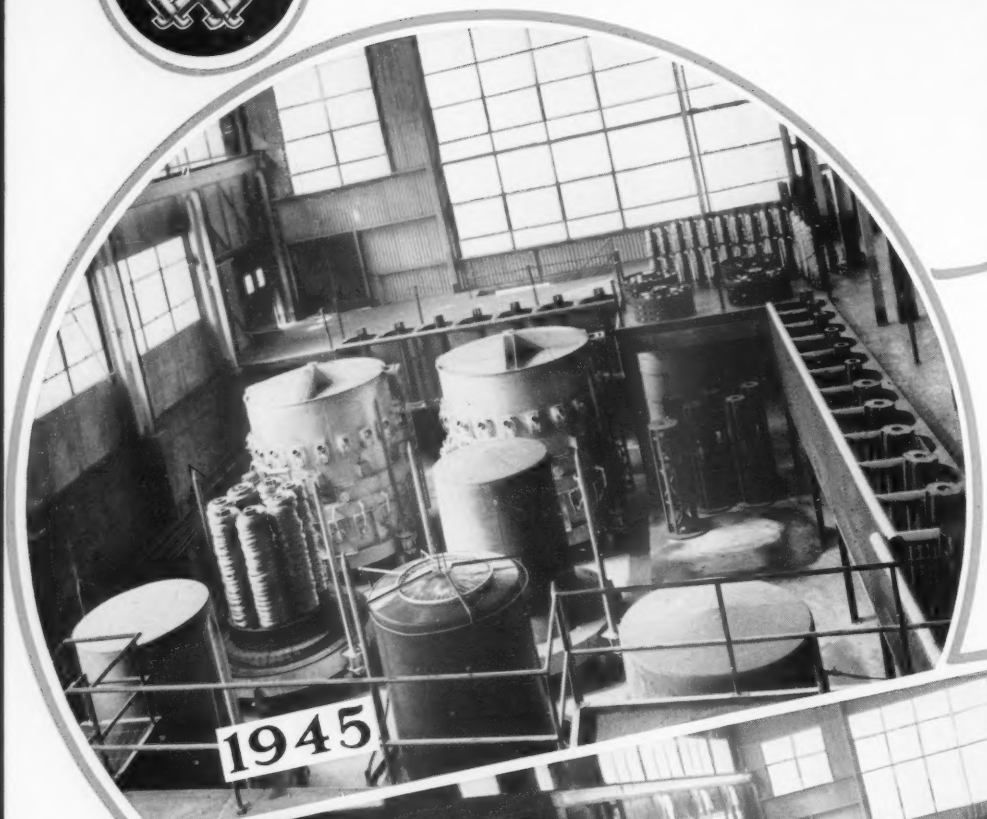
MORGAN CONSTRUCTION CO.

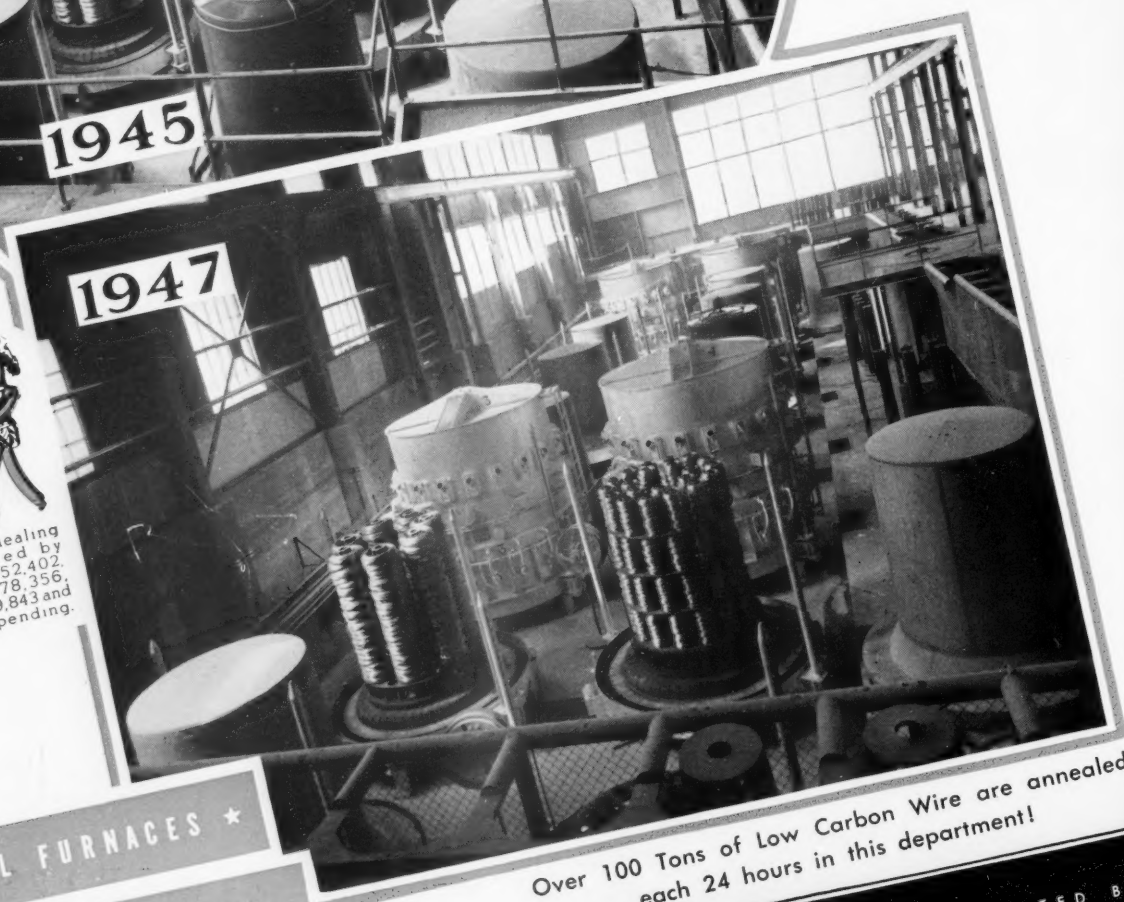
WORCESTER, MASSACHUSETTS

FICIAL PUBLICATION OF THE WIRE ASSOCIATION

The WILSON Wire Annealing Furnace installation at

the Palmer, Massachusetts Plant of the Wickwire Spencer Steel Division of The Colorado Fuel and Iron Corp. **Now** comprises 74"x84" Furnaces and 14 Bases.





The Wilson Annealing Unit is covered by Patents Nos. 1,952,402, 2,078,356, 2,068,477, 2,081,612, 2,089,843 and other patents pending.

Over 100 Tons of Low Carbon Wire are annealed each 24 hours in this department!

INDUSTRIAL FURNACES ★

RADIANT TUBE HEATING ★

HEAT TREATING PROCESSES

ENGINEERED AND CONSTRUCTED BY TH

Lee Wilson ENGINEERING CO., I

20005 West Lake Road CLEVELAND, O

Telephone ACademy 4670

FOUR extra services with Carboloy's "Complete Package"

Here's full value on dies—your Carboloy order brings you superior dies PLUS the Carboloy "Complete Package" Die Service, loaded with valuable extras like these:

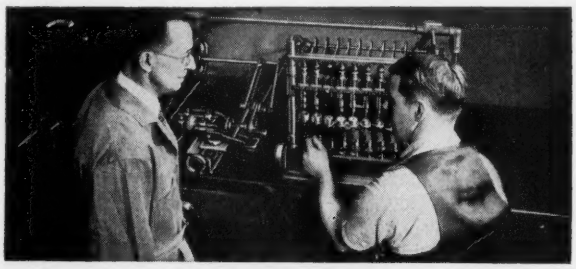
EXTRA 1: Carboloy Die Service Centers, for fast service or finishing.

EXTRA 2: Carboloy field engineers, right at hand when you need trouble-shooting help.

EXTRA 3: Carboloy Die Room Service, based on wide experience, available when you want equipment advice on specific operations.

EXTRA 4: Carboloy Training School, for teaching up-to-date, efficient Die Room methods to your personnel at no cost to you.

Even without these 4 extra services, Carboloy Cemented Carbide Dies are your best buy. They're known throughout industry for amazing long life, closer tolerances on drawn parts, fewer rejects, lower cost-per-piece and fine surface finish.



SERVICE CENTERS AND FIELD ENGINEERS

Here's double help for you: completely equipped Die Service Centers (in Chicago, Detroit, Pittsburgh & Thomaston)—AND expert field engineers—both available to help you in servicing or finishing dies.

LOCAL STANDARD STOCKS TO SUPPLY YOU PROMPTLY

A great aid to you in maintaining production schedules! Stocked in Chicago, Detroit, Los Angeles, Pittsburgh and Thomaston, Conn.—assuring speedy delivery in metal-working areas coast-to-coast.

FREE TRAINING OF YOUR PERSONNEL

At Carboloy's Die Training School in Detroit, your die room personnel receive thorough training in carbide die application and maintenance methods. Up-to-the-minute training for newcomers or seasoned veterans.

APPROVED DIE ROOM EQUIPMENT

Die finishing and servicing equipment made or recommended by Carboloy assures you of an efficient die room. Combine well-trained personnel with high-efficiency equipment and it spells fast die finishing in *your* mill.

Carboloy Cemented Carbide Dies are available in complete range of sizes and shapes for drawing, sizing, extruding. Contact your nearest Carboloy office, or write: Carboloy Company, Inc. 11171 E. 8 Mile Ave., Detroit 32, Michigan.

FREE! Write today for Free Die Service Manual, packed with handy tips, illustrated with photos and diagrams.

CARBOLOY CEMENTED CARBIDES

(REG. U. S. PAT. OFF.)

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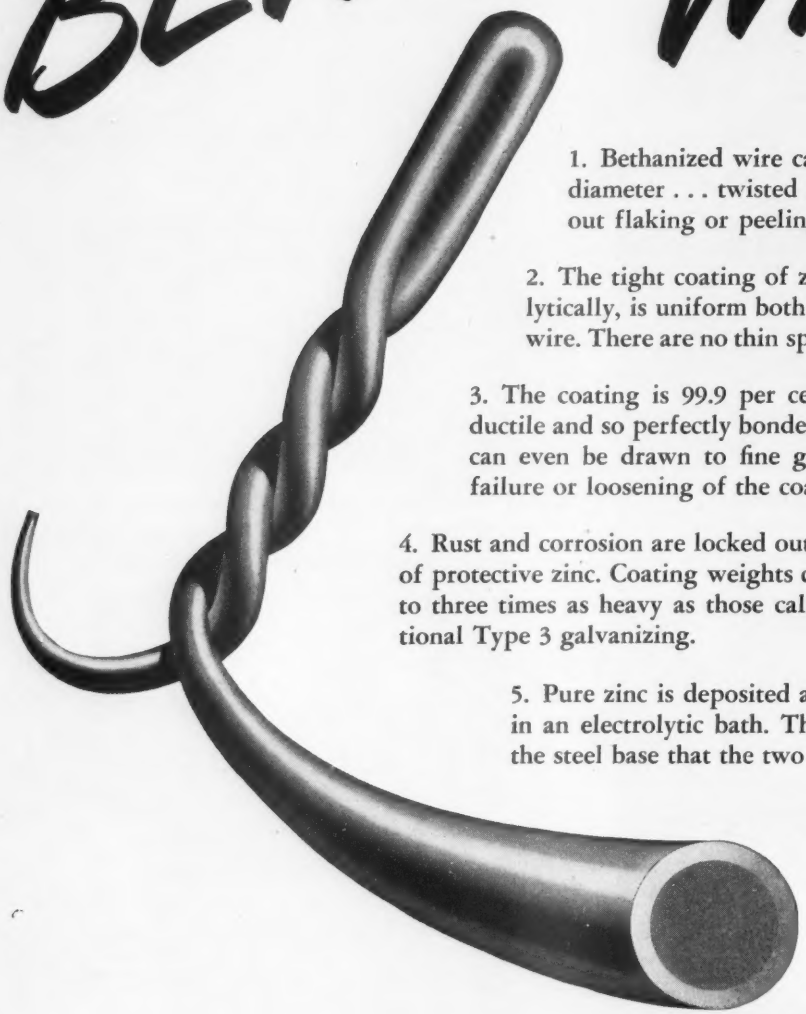
IT'S BETHANIZED WIRE



1. Bethanized wire can be wrapped around its own diameter . . . twisted . . . bent flat on itself . . . without flaking or peeling of the zinc coating.

2. The tight coating of zinc, deposited electrolytically, is uniform both around and along the wire. There are no thin spots to invite corrosion.

3. The coating is 99.9 per cent pure zinc. It is so ductile and so perfectly bonded that bethanized wire can even be drawn to fine gauge without causing failure or loosening of the coating.

4. Rust and corrosion are locked out by the tight bond of protective zinc. Coating weights can be supplied up to three times as heavy as those called for in conventional Type 3 galvanizing.

5. Pure zinc is deposited atom by atom on the steel wire in an electrolytic bath. The zinc is bonded so tightly to the steel base that the two metals become practically one.

Only bethanized wire offers these unique advantages. Here's your answer to those tough forming jobs. And don't overlook its high resistance to corrosion.

Give it a thorough tryout in your own plant. There's no better way to appreciate the superiority of bethanized wire.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation.

BETHLEHEM STEEL

WIRE & WIRE PRODUCTS, Vol. 22, No. 6, June, 1947, Publication Office, at 61 Cliff St., New York 7, N. Y. Executive Office, 300 Main St., Stamford, Conn. Published monthly by the Quinn-Brown Publishing Corp., Richard E. Brown, President; R. S. Spengel, Secy. and Treas. Subscription price: U. S., $5.00; Canada, $5.00 per year; 50 cents per copy; Foreign, $7.50 per year. Entered as second class matter, June 14, 1946, at the Post Office, New York, N. Y., under Act of March 3, 1879.

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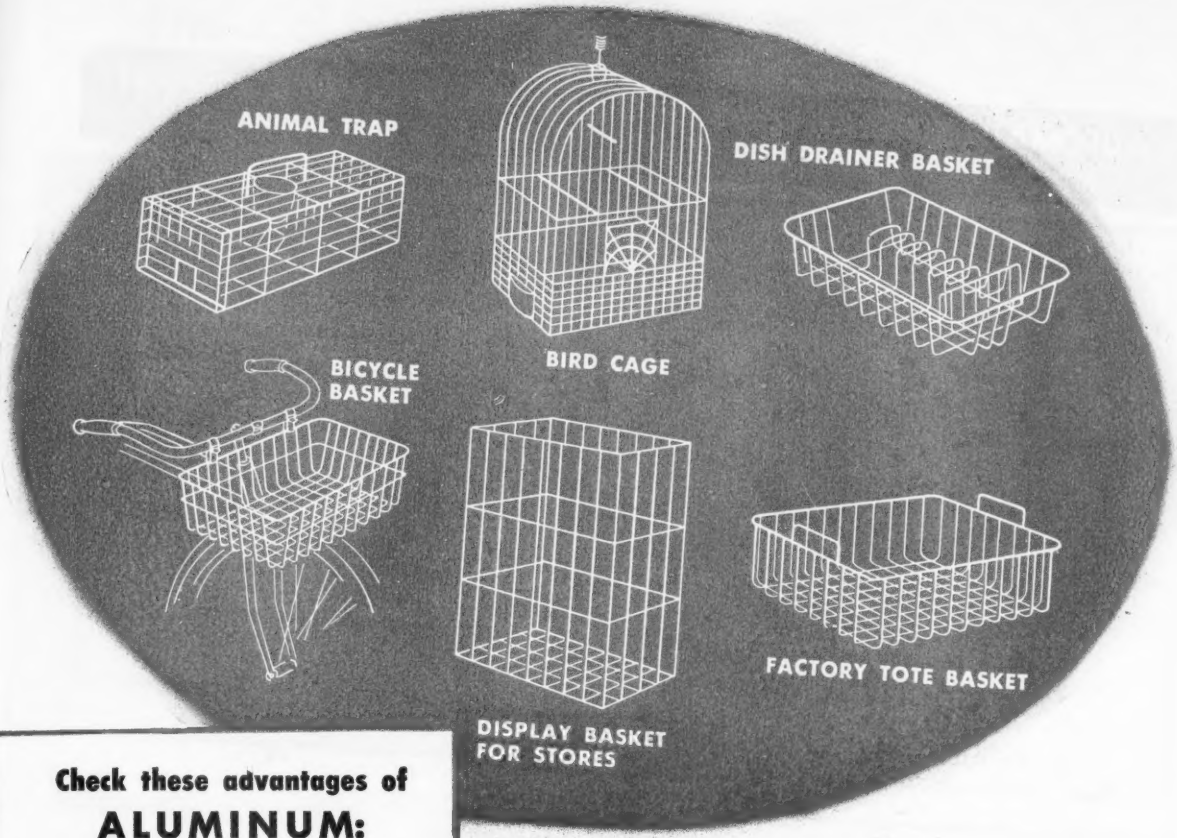

Check these advantages of

ALUMINUM:

● **Three for one**
One pound of aluminum produces *three* times as many feet of wire as a pound of brass, copper, steel, or stainless steel.

● **Corrosion resistance**
Aluminum does not rust or stain. Needs no painting to protect it.

● **Easy to work**
Aluminum can be fabricated on your present equipment.

● **Attractive appearance**
The pleasant, natural color of aluminum is desirable on many finished products. In addition, it can be economically colored in a wide variety of shades.

You can get it **NOW...**

ALCOA ALUMINUM

FOR WIRE GOODS

The aluminum wire you need is readily available from Alcoa—in the proper sizes, shapes and alloys.

Phone your nearest Alcoa sales office. ALUMINUM COMPANY OF AMERICA, 1828 Gulf Building, Pittsburgh 19, Pa. Sales offices in leading cities.

MORE people want MORE aluminum for MORE uses than ever

ALCOA FIRST IN ALUMINUM

IN EVERY COMMERCIAL FORM

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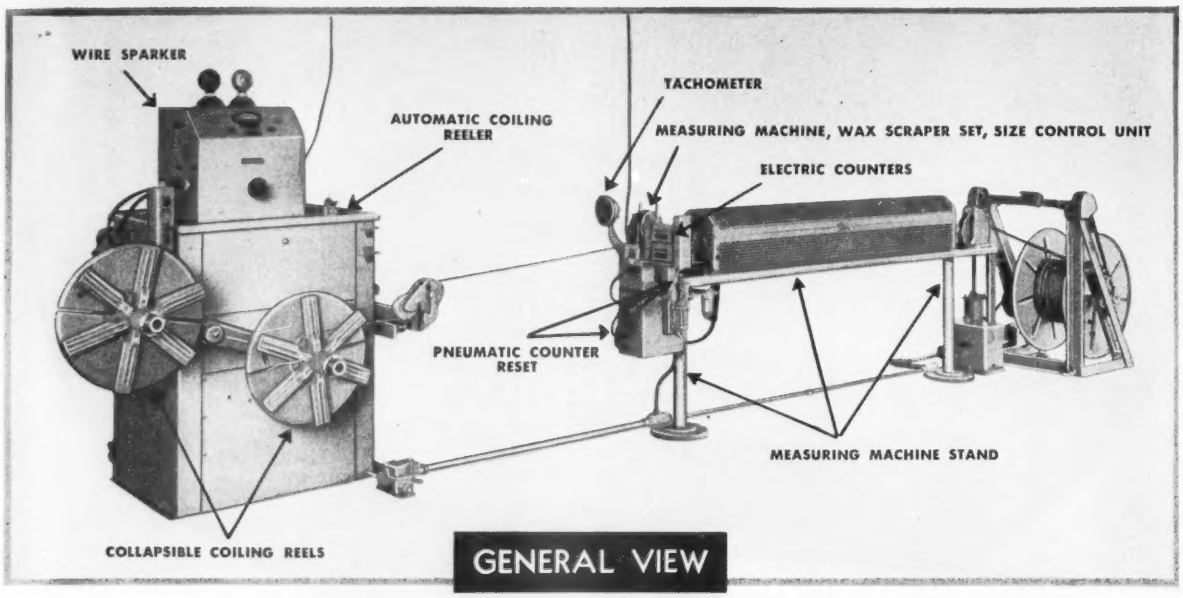
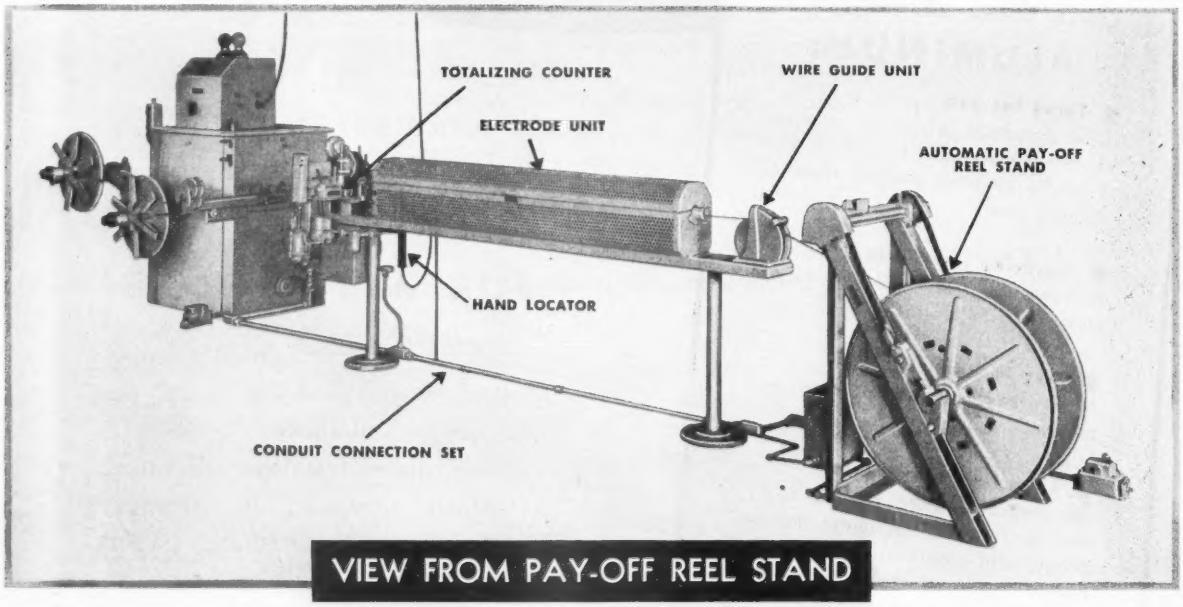
AUTOMATIC COILING, MEASURING AND SPARK-TESTING EQUIPMENT FOR USE IN COILING FINISHED WIRE



GENERAL VIEW



VIEW FROM PAY-OFF REEL STAND

Quotations on Complete Sets of this Equipment Available on Request.

JAMES L. ENTWISTLE CO.

43 CHURCH STREET, PAWTUCKET, RHODE ISLAND

World's Leading Manufacturer of Spark-Testing Equipment

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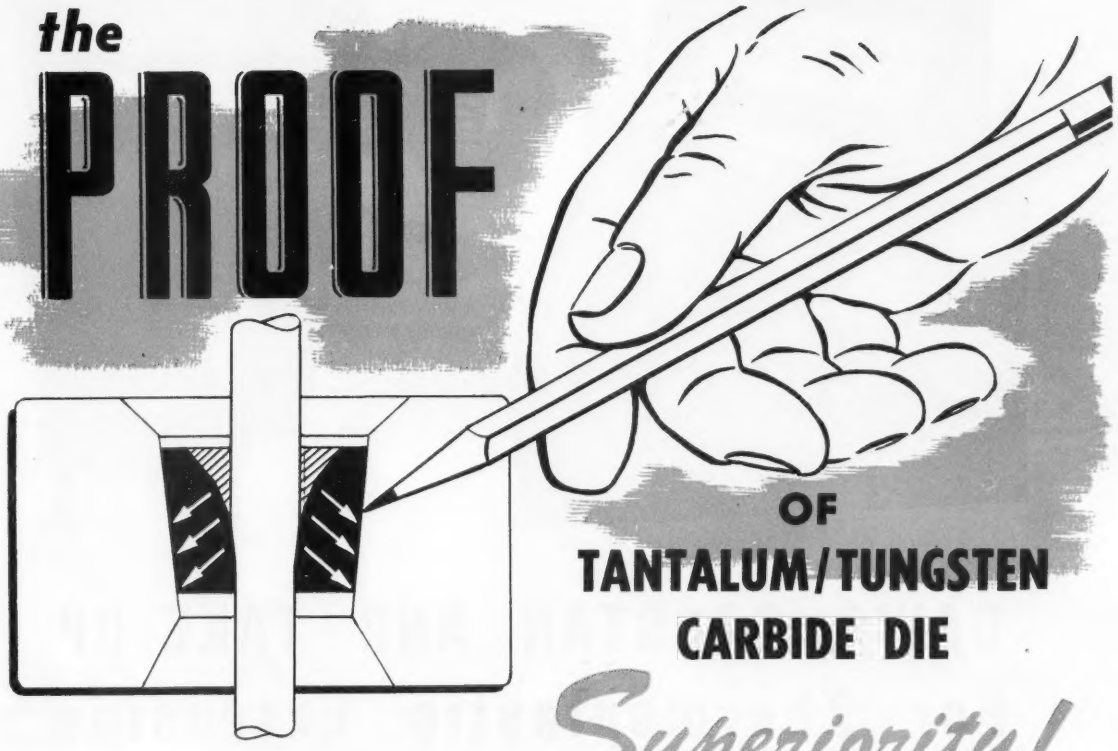
the PROOF OF TANTALUM/TUNGSTEN CARBIDE DIE *Superiority!*



The V-R "Tapered Nib" standard round hole carbide die design is the most important and practical improvement in die design offered to industry in the past decade.

GREATER STRENGTH — Tapered nib design increases absorption of drawing stresses. Side walls of nib are taper-gripped resulting in tremendous internal strength.

SIMPLE MAINTENANCE — Tapered grip casing means no steel casing to cut for refinishing or resizing . . . a real saver.

MAXIMUM VISIBILITY — Extra wide tapered front and back openings permit simple easy inspection.

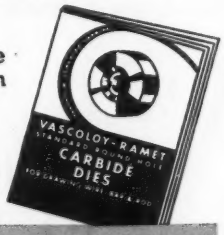
CONCENTRICITY — V-R method of precision die manufacturing assures you of a perfect, concentric drawing surface.

FREE OF POROSITY — Another outstanding achievement of V-R die quality control is the elimination of porosity in carbide.

HIGHER FINISHES — V-R Tantalum/Tungsten carbide die nibs take a higher finish than any other die material.

MAKERS OF WORLD'S FINEST VR Carbides

Write for your copy of Carbide Die Bulletin VR-348 today!



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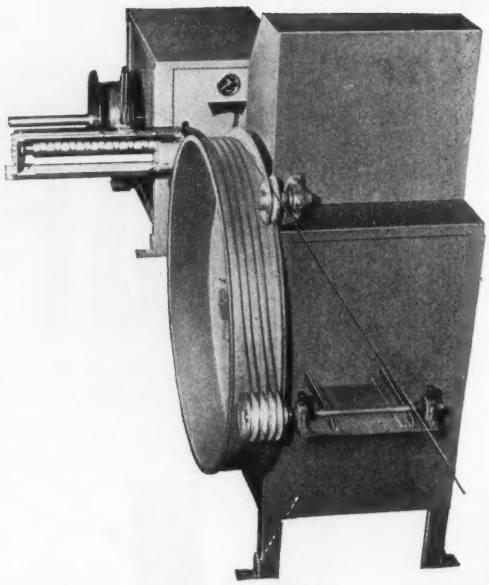
AN AFFILIATE OF FANSTEEL METALLURGICAL CORPORATION AND VANADIUM ALLOYS STEEL COMPANY



DAVIS CAPSTAN AND TAKE-UP For Thermoplastic Extrusion

HANDLES ANY VARIATION OF WIRE SPEED FROM 50-1500 F.P.M.

Capstan is individually motor driven and has a variable speed range of 15-1, and built-in tachometer showing feet per minute.

The Take-Up is operated by a polyphase motor which, by the use of tapped inductances, varies the speed of the take-up and the tension of the wire to suit a wide range of requirements. Is equipped with adjustable traverse to take reels up to a width of 14" and a maximum diameter of 30".

Between the Take-Up motor and the main shaft of the Take-Up is a 3-1 variable speed unit. The motor has a range of speeds from 300-1500 RPM, and, with the variable speed unit, a maximum speed range of 15-1 is possible. The Take-Up units are belt driven, and by simply changing a pulley, the range is increased to 30-1. This will take care of any variation in speed per minute of the insulating machine.

DAVIS
EQUIPMENT
FOR THE
WIRE INDUSTRY

SPARK TESTERS • SPOOLERS • TAKE-UPS • CAPSTANS

THE R. L. DAVIS ELECTRIC CO., INC., WALLINGFORD, CONN.

KEEPING wire in the process of drawing "COOL AS A MOUNTAIN STREAM" is an attainment we hope eventually to reach. We aim always to take the problem of ultimate perfection in wire lubrication step by step as it is put up to us to solve.

Standard Wire Lubricants are universally used both in this country and in foreign countries. We welcome the oportunity of extending our personal service in any drawing problems you may have.

STANDARD · INDUSTRIAL COMPOUNDS CO.
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ENAMELED COPPER	TWISTED MULTIPLIES	CELANESE COVERED
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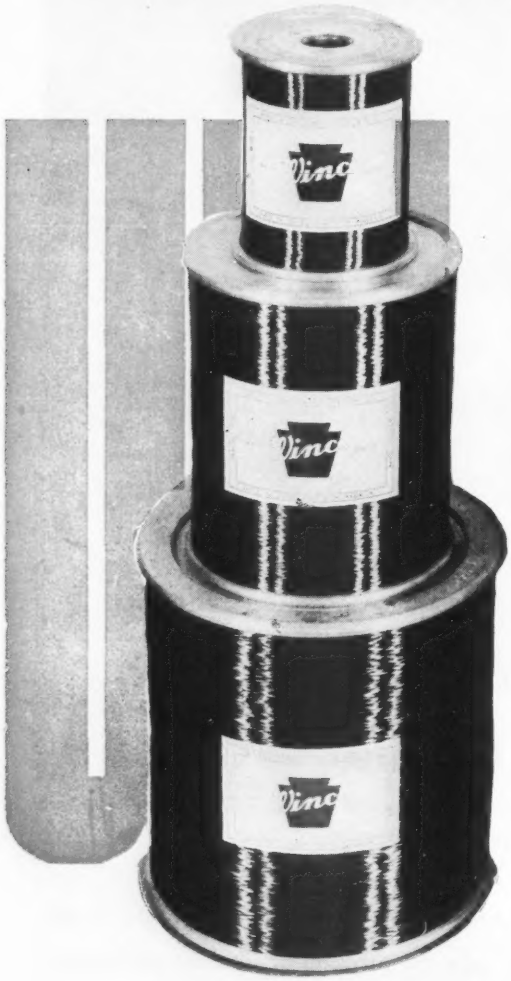
ENAMELED ALLOY	SILK COVERED	LITZENDRAHT AND
ENAMELED ALUMINUM	COTTON COVERED	SPECIALS TO ORDER



There's more to present day engineering and design problems than shortages of materials, priorities, etc. There is also the question of whether specifications have been rigidly adhered to. Wire, for example, must meet such requirements as specific electrical properties, flexibility, tensile strength, laying speed, uniformity, etc.

Whether it's a buyer's or seller's market, WINCO magnet wire products are drawn to exact specifications. Uniformity of product is guaranteed by mercury process tests and careful supervision guards against variations in consistency, structure or electrical values.

If you have a wire problem, our complete facilities are at your disposal. Send blueprints or specifications for recommendations, without obligation. Samples sent on request; write today.

WINSTED DIVISION

HUDSON WIRE COMPANY

WINSTED CONNECTICUT

3 TAPE QUESTIONS

CAN YOU ANSWER THEM?

General Electric, a pioneer in the field of electrical insulation, has continued during the past 50 years to improve these products through research and experimentation. This, coupled with the most modern equipment and manufacturing methods, has resulted in the production of electrical insulation of recognized quality and dependability.

There are varnished cloths and varnished cloth tapes for every cable according to its function. For your cable insulation problem, write to the Resin and Insulation Materials Division, Chemical Department, General Electric Co., Schenectady 5, N. Y.

CABLE TAPE

QUESTION No. 1: What insulating factors of cable tape are largely determined by the varnish?

ANSWER

The varnish determines the tape's dielectric strength and its chemical- and moisture-resistant characteristics. General Electric uses a high-grade, heat-resistant, black asphalt-base varnish—the result of nearly 50 years of experimentation by G.E. laboratories. It helps insure a cable tape with high insulating values and outstanding electrical properties.

QUESTION No. 2: What advantages are there in pre-testing cable tape?

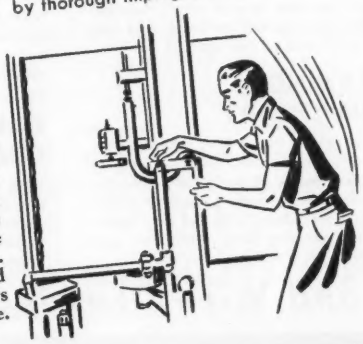
ANSWER

Pre-testing brings to light any flaws in the cloth itself. Mechanical and dielectric strength can be accurately determined before the tape is used, and resistance to chemicals and moisture can be established to help guarantee long and efficient service life. Each lot of G-E tape is carefully pre-tested to make certain that it has all the important insulating values.

QUESTION No. 3: What insulating values are obtained by thorough impregnation?

ANSWER

Thorough impregnation means that the varnish is forced into the cloth and not just coated on. A coated tape looks good . . . is smooth and glossy . . . but has a relatively short service life. With G-E cable tape the varnish is forced into the cloth fibers by heavy rollers. After curing, it is again pressed through the impregnating rollers and given a final baking cure.



GENERAL ELECTRIC

CD47-T5

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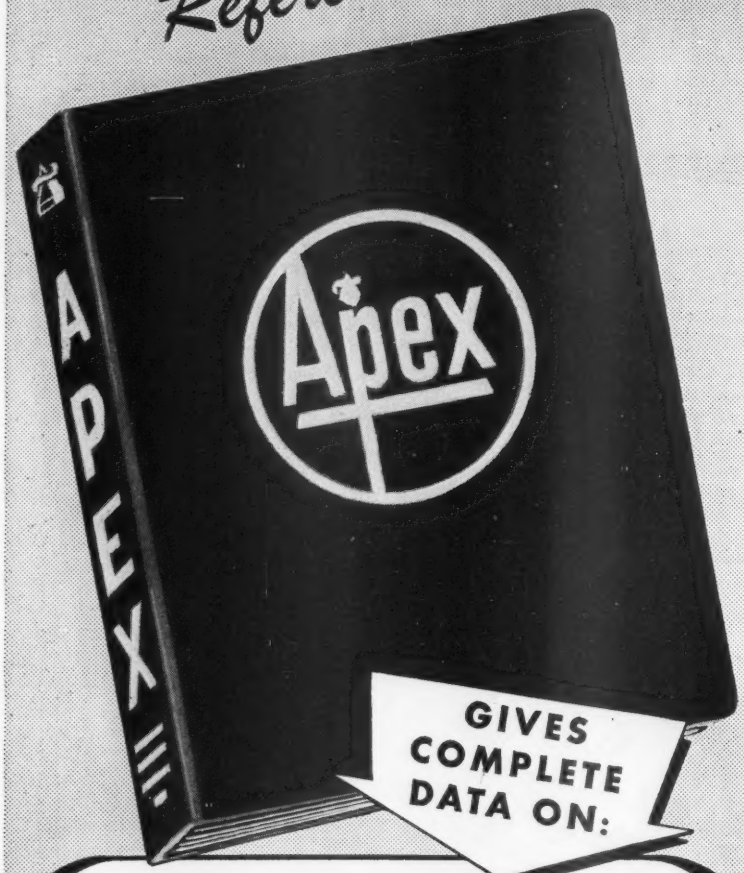
Ready Reference CATALOG!



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Just how important is greater die life to you? Increased speed? Improved finish? There are many ways in which these objectives may be accomplished, and they are explained in this catalog.

CLEANING COMPOUNDS

Do you realize that it is no longer necessary to employ a high alkaline cleaner to lick a tough cleaning job? Recently developed water and oil emulsion cleaners have introduced a brand new factor into the cleaning field. These, too, are covered in this new Apex catalog.

DEEP DRAWING & STAMPING

How up-to-date is your present practice? What has been your experience with the recently developed alloys—both ferrous and non-ferrous? The results of our experiences are discussed in our new catalog.

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With what problems are you confronted in your plant in order to obtain finer ground finishes? Our ideas on the latest developments on cutting compounds are presented in this Apex book.

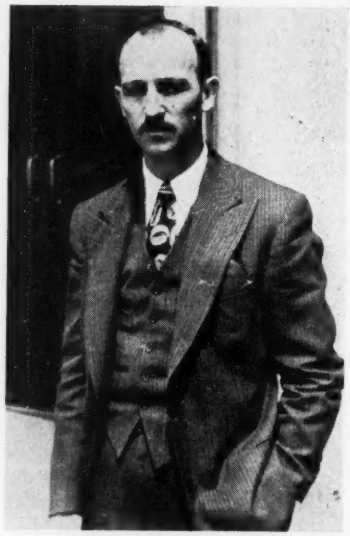
—and Wire Drawing Compounds

WRITE FOR COPY ON YOUR LETTERHEAD

APEX ALKALI PRODUCTS CO.

MAIN & RECTOR STS., PHILADELPHIA 27, PA.

APEX PRESENTS PROMINENT MEN IN THE WIRE INDUSTRY



L. D. Seymour
Manufacturing Manager
John A. Roebling's Sons Co.
Trenton, N. J.

Graduated High School at 20 years of age, Penn State in 1926 at 24. Lives at Morrisville, N. J.

* * *

Has three children —

Jack is the eldest. Is a junior at Penn State majoring in Hotel Administration. At the present time is leaning toward restaurant management.

Dick has received his appointment to the Naval Academy at Annapolis and hopes to be able to enter in June.

Marjorie, the youngest, attends the Lower Makefield Jr. High and has won her letter in field hockey.

* * *

Hobbies:

Fishing

Doing ranch work at home.

* * *

Other spectacular events:

Killed his first bear single handed at age 19 in Coudersport, Pa.

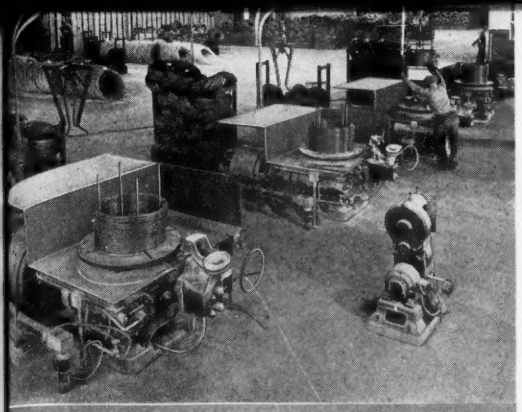
Fought his first forest fire at the same place a year later.

* * *

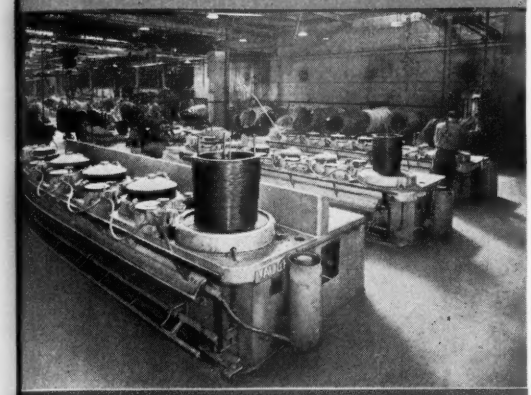
Now: V. P. of Wire Asso. and on Board of Directors.

* * *

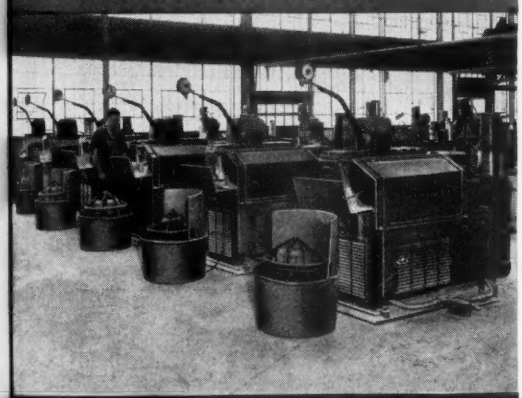
Moral: You, too, can be Vice-President — just go out and get yourself a bear!



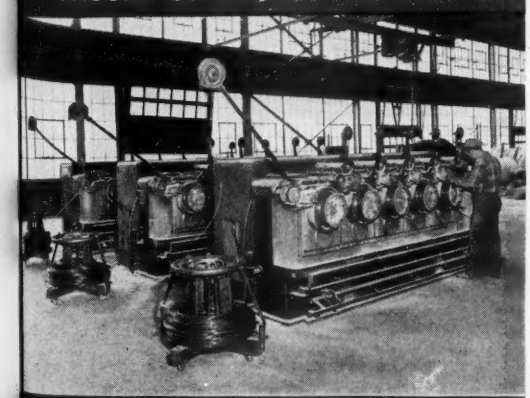
VAUGHN MOTOBLOC



VAUGHN MOTOBLOX



VAUGHN CONTINUOUS MACHINES



COMPLETE COLD DRAWING EQUIPMENT

Continuous or Single Hole . . . for the Largest Bars and Tubes . . . for the Smallest Wire . . . Ferrous, Non-Ferrous Materials or their Alloys.

DRAW YOUR BACKLOG INTO Wire

. . . FASTER, MORE PROFITABLY WITH Vaughn

WIRE DRAWING MACHINERY

Are you faced with orders piled up far into the future for many types of wire? Let the high speeds, flexibility and adaptability of Vaughn Wire Drawing Machinery improve your manufacturing position—help satisfy your customers with the *production* they demand—and *build profits* through modern, cost-cutting efficiency month-in and month-out on the job. *Let us advise on your coming requirements!*

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CUYAHOGA FALLS, OHIO, U.S.A.

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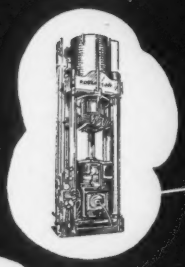
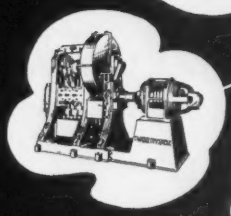
PROFITABLY USED BY LEADING PRODUCERS SINCE 1860

fine high-pressure hydraulic equipment FOR THE LEAD CABLE ENCASING INDUSTRY

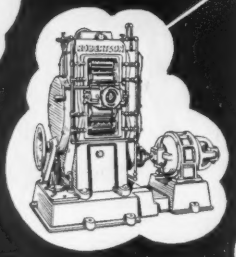
. . . used by leaders the world over



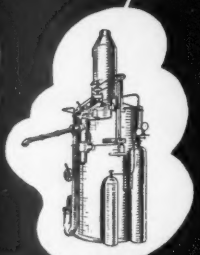
Cable Lead Encasing Press,



High Pressure Hydraulic Pumps,



Lead Sheath Stripping Machine,



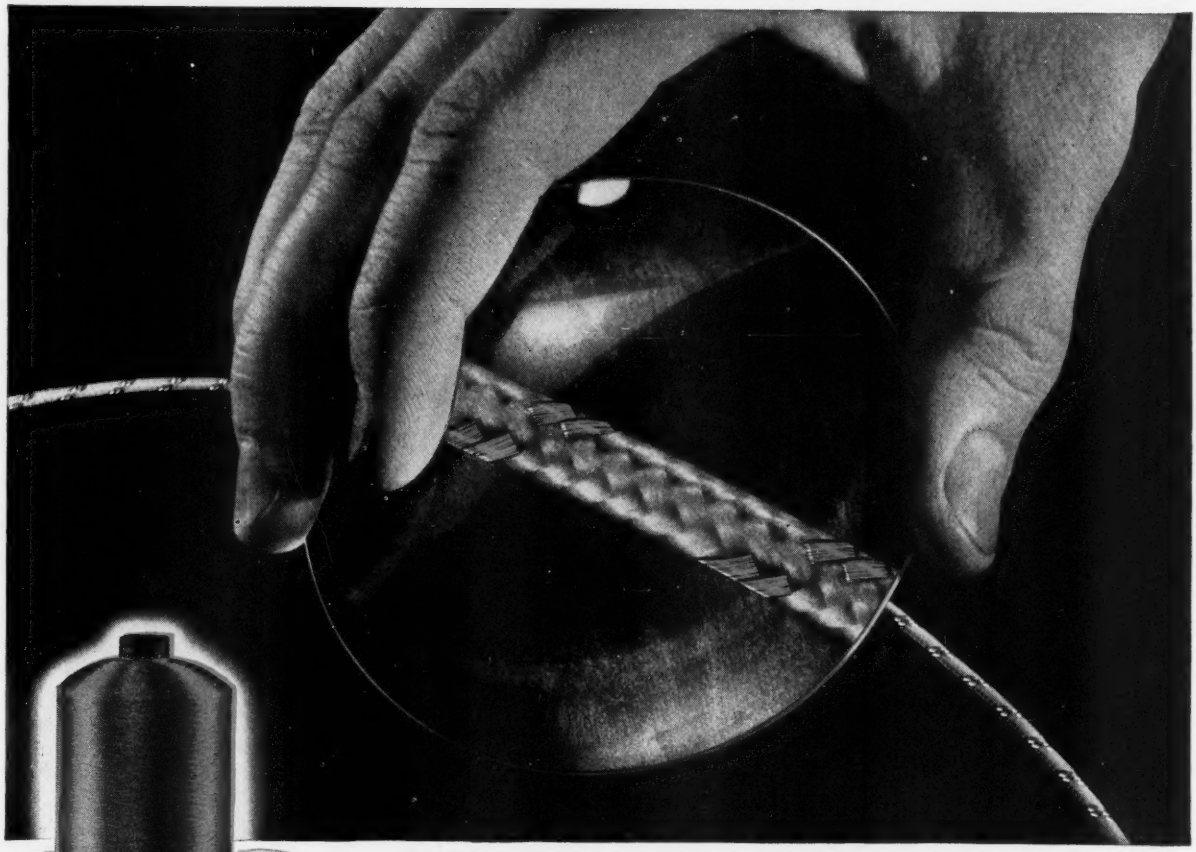
Closed Lead Melting Pot.

JOHN **Robertson** COMPANY, INCORPORATED

125-135 WATER STREET, BROOKLYN 1, NEW YORK

Designers and Builders of all Types of Lead Encasing Machinery

Since 1858



DYED FIBERGLAS YARN IN 9 COLORS

Blue • Red • Green • Yellow • Brown • Orange • Slate • Purple • Black

Dyed Fiberglas* yarn is used as marker yarn in the manufacture of rubber-covered wire, nonmetallic-sheathed building cable, flexible cord and fixture wire.

In the production of radio hook-up wire, aircraft cable, etc., Dyed Fiberglas yarn is used as circuit tracers. It is braided over the primary insulation in combination with white yarns or in solid colors to form color coding.

Dyed Fiberglas yarn has high tensile strength and, therefore, can be applied as marker yarn with minimum breakage. And yarns of exceptionally small diameter are available for applications in which space is at a premium.

Dyed Fiberglas yarns will not form gas pockets under high-temperature extruding conditions. They are resistant to chloroform, carbon tetrachloride, Stoddard Solvent and Toluene. Since all Fiberglas yarns are resistant to heat, moisture and fungi, Dyed Fiberglas yarns offer a decided advantage in all applications requiring color.

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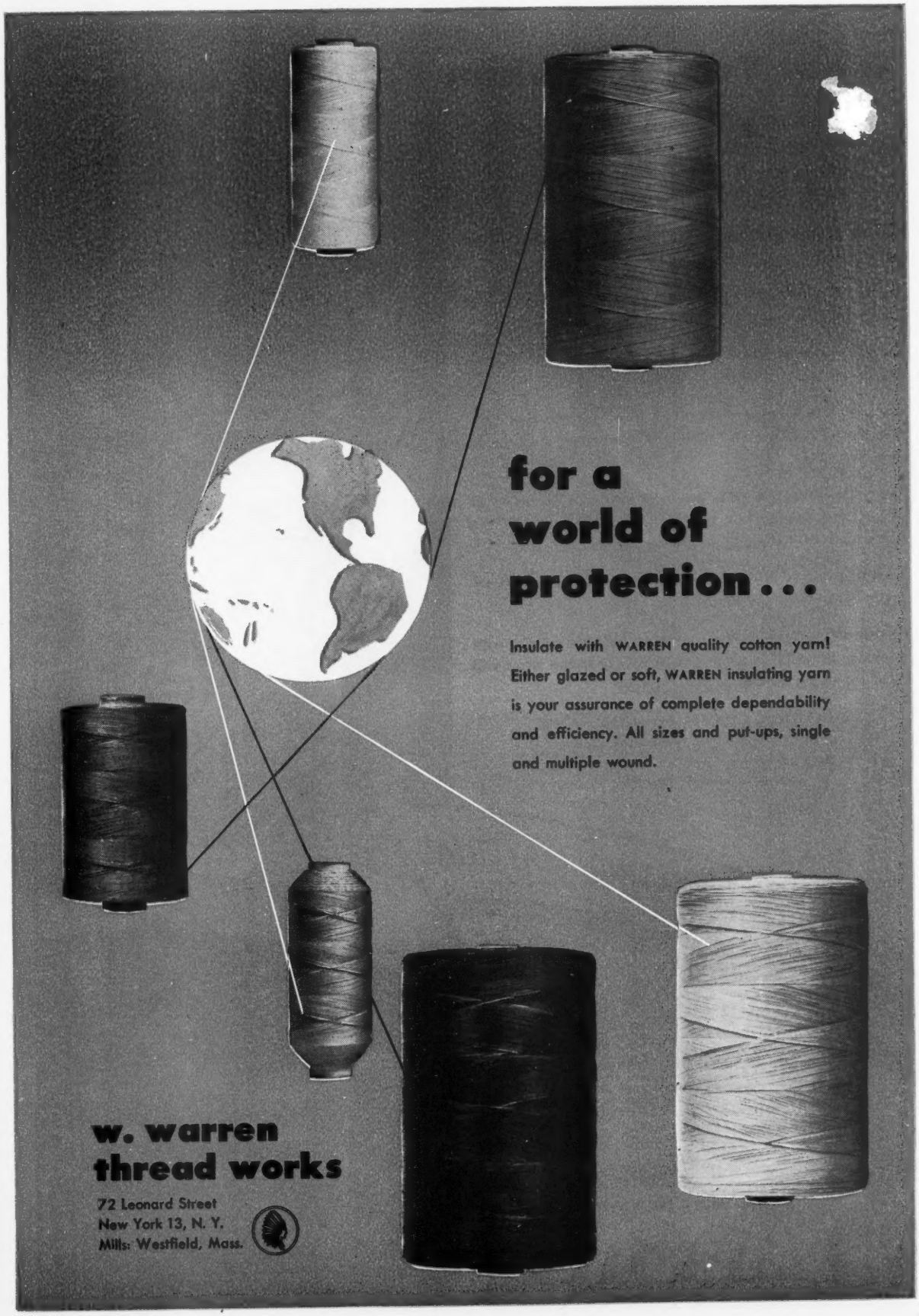
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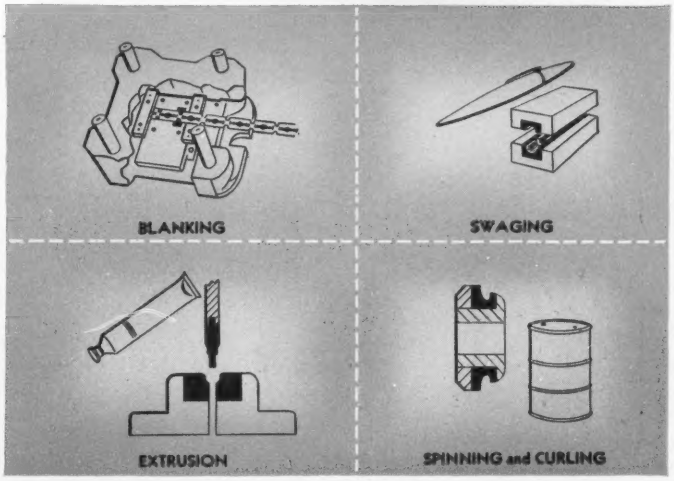

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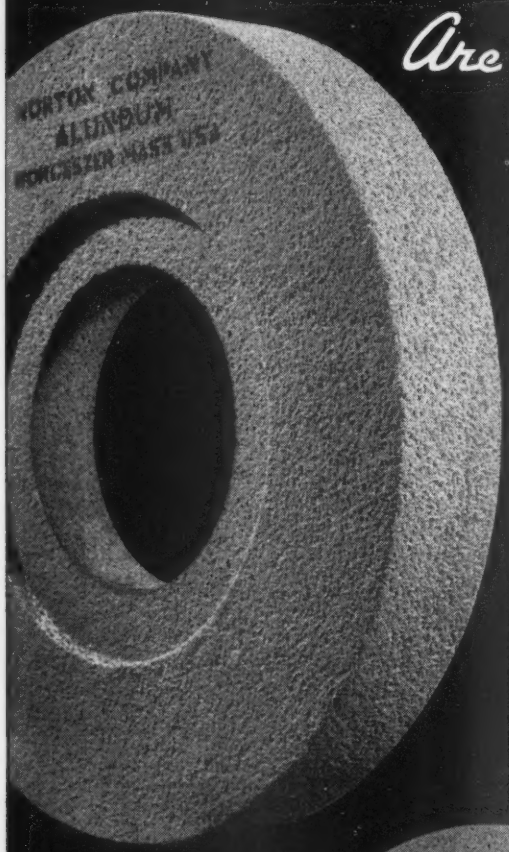

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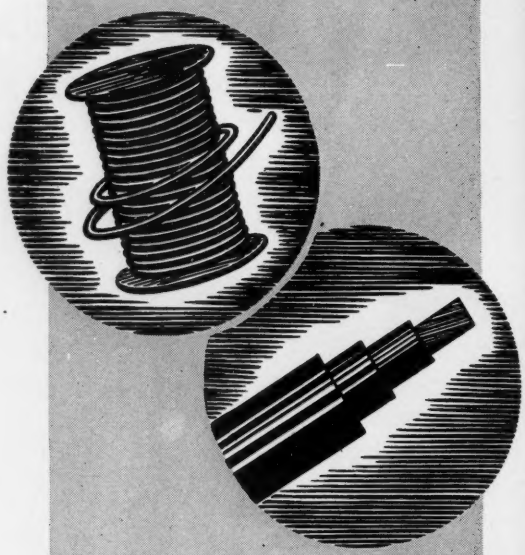

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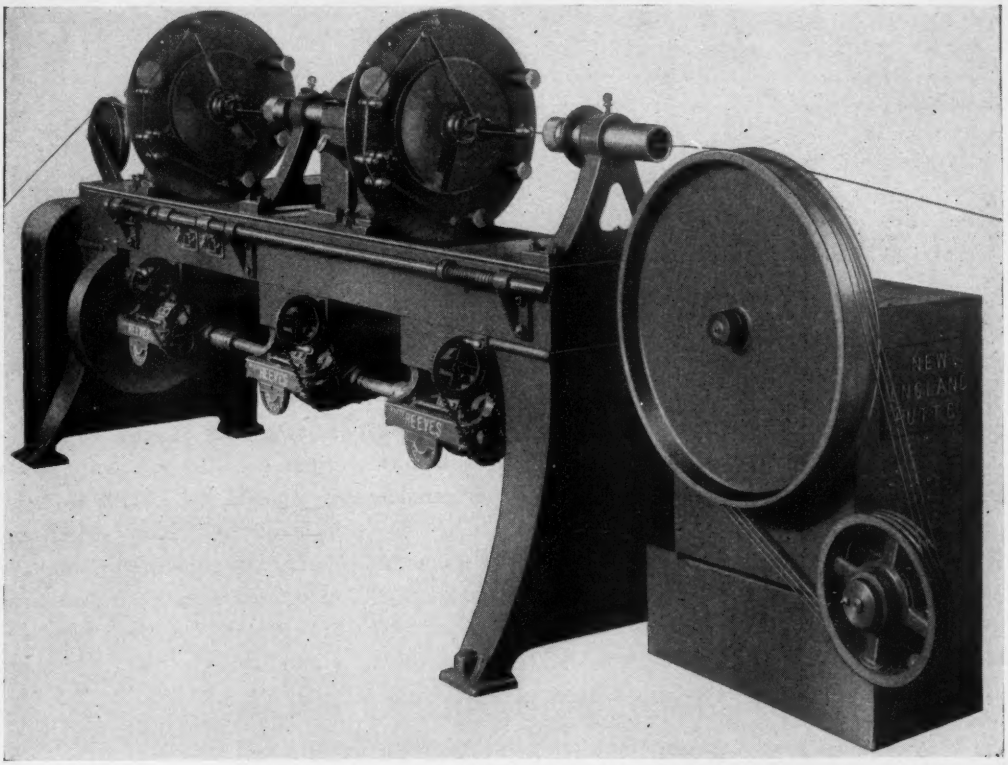

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Individually controlled variable speed on each head and capstan.
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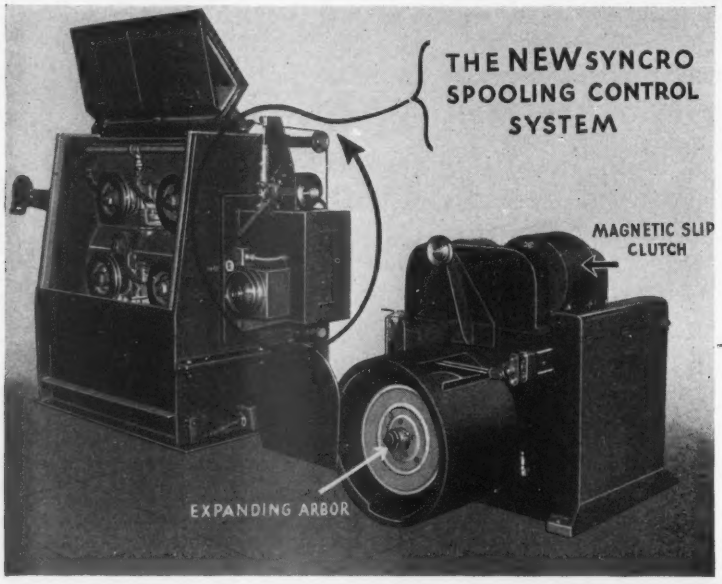
Old fashioned bookkeeping methods had to give way to modern streamlined procedures. And wire drawing equipment designs that served their purpose when the industry was in its infancy cannot cope with modern production requirements. Recognizing this fact, Syncro engineers never hesitate to break with traditional designs when such action results in equipment that provides higher speed production of quality wire and cable at lower cost. The beneficial effects of this policy are apparent in many advancements—such as the Syncro Automatic Spooling Control system. Consisting of a Syncro magnetic slip clutch driven spooler operating in conjunction with the Syncro built-in capstan control, this system provides a smooth, automatically compensating spooler drive with readily adjustable tension control for various wire sizes. The tension control is easily adjusted to obtain constant and equal wire tension from core diameter to full spool, and slip on the finishing capstan during deceleration is eliminated, which reduces wear and prevents "burning off" of wire.



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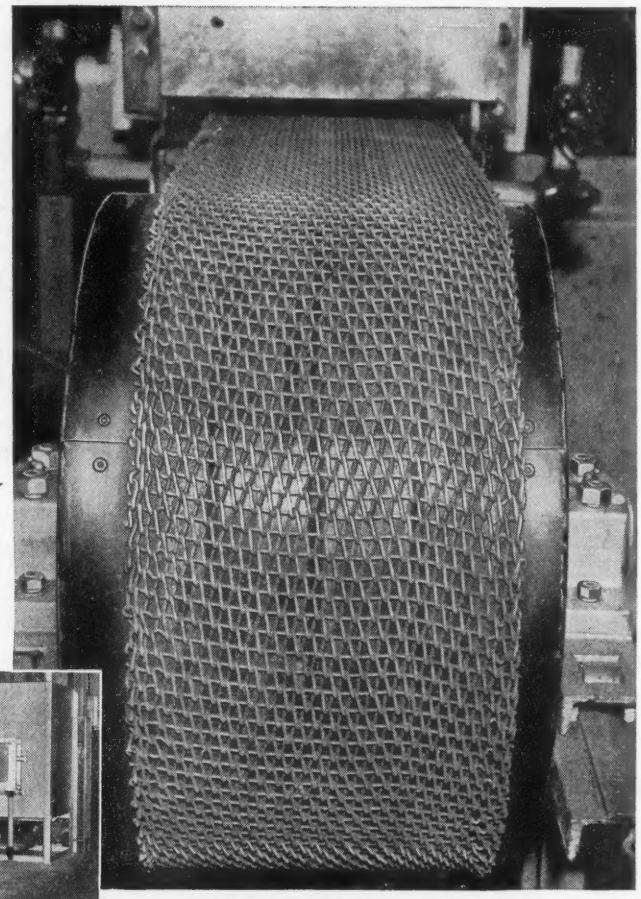
Machinery for the Wire Industry

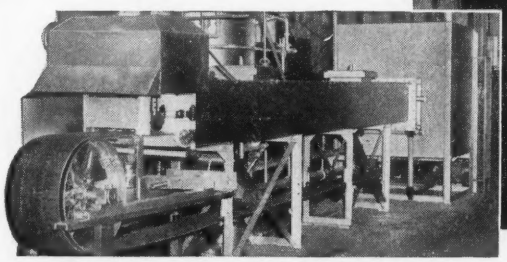
SYNCRO

"8,640 hrs. at temperatures from 1300 to 2040° F." ...and this belt's still going strong

...and that's only part of the story



Here's proof of Inconel durability. After 8640 hours in temperatures from 1300 to 2040°F., this Inconel conveyor belt was found to be in excellent condition. Not a single link had to be replaced.



Copper brazing furnace of Beech Aircraft Corp., Wichita, Kansas, equipped with Inconel belt obtained through Electric Furnace Co., Salem, Ohio.

● When Beech Aircraft Corporation called for an Inconel* brazing-furnace conveyor belt, they naturally expected long life. But, they got more. They got repair-free service. Their recent letter reads:

> *"The Inconel woven wire belt on our copper brazing furnace was placed in service September 6, 1945 — 24 hours per day — for draw and copper brazing.*
>
> *"It has been in continuous service since that date, except for down time of approximately 30 days during October 1946. At that time, repairs were made to the furnace,* but not to the belt.
>
> *"This belt now has been in operation for a total of 8,640 hours at temperature range of 1300 to 2040°, the stand-by temperature being 1300°.*
>
> *"We have made no replacements in the linkage to date."*

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The Crum Calculator for Wire Drafting

Provides answers simply and accurately for a given mathematical wire drafting problem. One setting shows number of holes, percentage of draft per hole, total reduction in area and intermediate die sizes to be used. Universality: Because of the circular scale there are neither upper nor lower limits on the diameters that the calculator can be used for.

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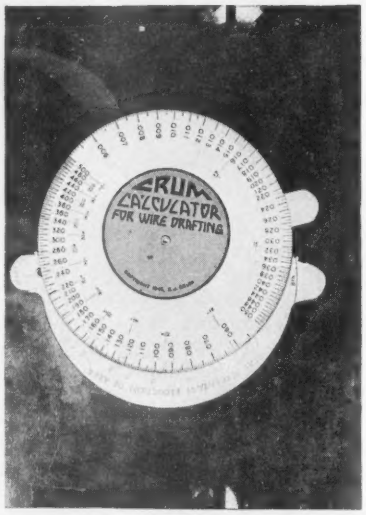

Simple to operate; compact enough to carry in vest pocket; can be used for Metric as well as English systems; all diameters given in decimals. A handy and time-saving device that will eliminate time-wasting and possible errors in calculations.

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The calculator can be used for drawing round copper or any other metal wire.

EXAMPLES OF PROBLEMS SOLVED QUICKLY BY USE OF THE CALCULATOR

PROBLEM No. 1

DETERMINE the reduction of area in drawing ¼-inch diameter rod to .120 inch wire.

PROBLEM No. 2

SUPPOSE that in Example 1 the tensile strength of the stock is such that the drawing process produces a tensile strength of 100,000 pounds per square inch in the .120 inch wire. To develop the same tensile strength in an .080 inch diameter wire, what stock size is required when the tensile strength of the stock is assumed to be the same as that in Example 1.

PROBLEM No. 3

IN the drafting of .0625 inch diameter wire to .025 inch, no single draft must exceed 21 per cent. Determine the minimum number of holes for this job.

* * *

THE Crum calculator is designed especially for wire drawing jobs involving eight or fewer drafts. Problems involving a greater number of drafts can be solved, however, with extra manipulation. For instance, if it is desired to set up a multi-draft machine to draw .0095 inch diameter wire from .0625 inch stock in sixteen drafts, the intermediate die sizes can be determined by the calculator.

PROBLEM No. 4

A CERTAIN five-block continuous wire drawing machine has a capacity permitting a draft of 33 per cent per hole on low carbon wire. For economic reasons it is desired to find the largest stock size that can be used when finishing .0455 inch diameter wire on this machine.

* * *

PROBLEM No. 5

A continuous machine is to be set up to draw .0375 inch tire bead wire six holes from .122 inch diameter stock. All drafts are to be equal in percentage reduction of area. Determine "a" the intermediate die diameters; "b" the per cent reduction of area per hole; "c" the total per cent reduction of area from start to finish.

PROBLEM No. 6

THE diameter of the finishing block of a double-deck wire drawing machine is twenty-four inches; the diameter of the first block, seventeen inches. The operator wishes to finish .142 inch diameter wire from No. 5 rod and therefore must determine (a) the minimum draft for the finished die, (b) the minimum first die size, (c) and the first die size when a slippage of ten per cent is allowed.

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The Wire Outlook

Many economists feel that we are now in the first stage of recession and the extent to which it may go depends on the movement of prices and the efficiency of labor.

The Administration did lip service to the cause of price cutting, all the while knowing that wages were being advanced to a degree that literally pegged prices at present levels in the heavy industries. At least it may have accomplished an end insofar as it stopped further advances for the moment. Some wire mills are now quoting fixed prices for future deliveries on the reasonable assurance that the upward trend has been halted and that no major work stoppages are likely during the next two years.

At the time we go to press, action on labor legislation lags. Much pressure is being exerted on members of Congress to formulate a "mild" bill and on the President to vote anything that would serve to correct basic abuses. There are enough vote-fearing, politically minded solons to make it probable that the final bill to be offered will be shorn of many essential features necessary to put a full check on the perfidy, exploitation, terrorism and Fascistic methods inherent in the present system of union leadership. The most stringent proposals offered at any time would not harm labor itself, but would limit the activities of its leaders, insofar only as they might continue to be dictatorial, irresponsible and indifferent to public welfare.

The recent fifteen cent wage hike has given considerable comfort to our foreign competitors, as already American concerns have lost important orders for equipment that lower wage scales in other countries enabled foreign competitors to capture. To maintain full employment at home requires a healthy export demand and an active construction program. The high cost of labor and material has already reduced building construction to lower levels than those of 1946.

Building curtailment has had its effect on the wire industry in the growing availability of nails in many sections of the country. Wire rope, for the same reason, is in definitely less demand. Some mills have experienced a sharp drop in orders for rope wire, while others report that business is holding up in spite of expectations to the contrary.

Merchant wire products remain tight. Wire for fasteners is so short, particularly for cold-worked types, that production activities, — bolts, nuts and rivets — has been considerably slowed.

While there has been some improvement in the supply of wire, it is not yet sufficient to make the going easy for all non-integrated mills. Many of these mills see a growing supply of rods and wire after June, with a steadily improving picture througout the balance of 1947.

The reason for the unprecedented shortage of wire, of course, was the cutting off of civilian supplies during the war. For two years there has, therefore, been an extraordinary demand for every type of wire occuring simultaneously. Normally when one or more types will be needed, other kinds will be slack and overall production facilities are then kept in balance. There is evidence that the appetite for certain types of wire is being satisfied and of a beginning of a return to normal conditions.

While the demand for most types of new equipment continued strong, certain accessory manufacturers are noting a curtailment in orders. A point in case is spools and reels. Orders for these have fallen to replacements, with orders for anticipated future needs put off. Another is diamond dies. The flatness of this useful branch of the wire industry in the face of continued high activity in the fine wire and copper wire mills is explained by the fact that during the war mills used dies until off-size and then discarded them. With the higher cost of diamonds, these old dies are being recut and polished for current use. The die business will be slow until this old stock is consumed.

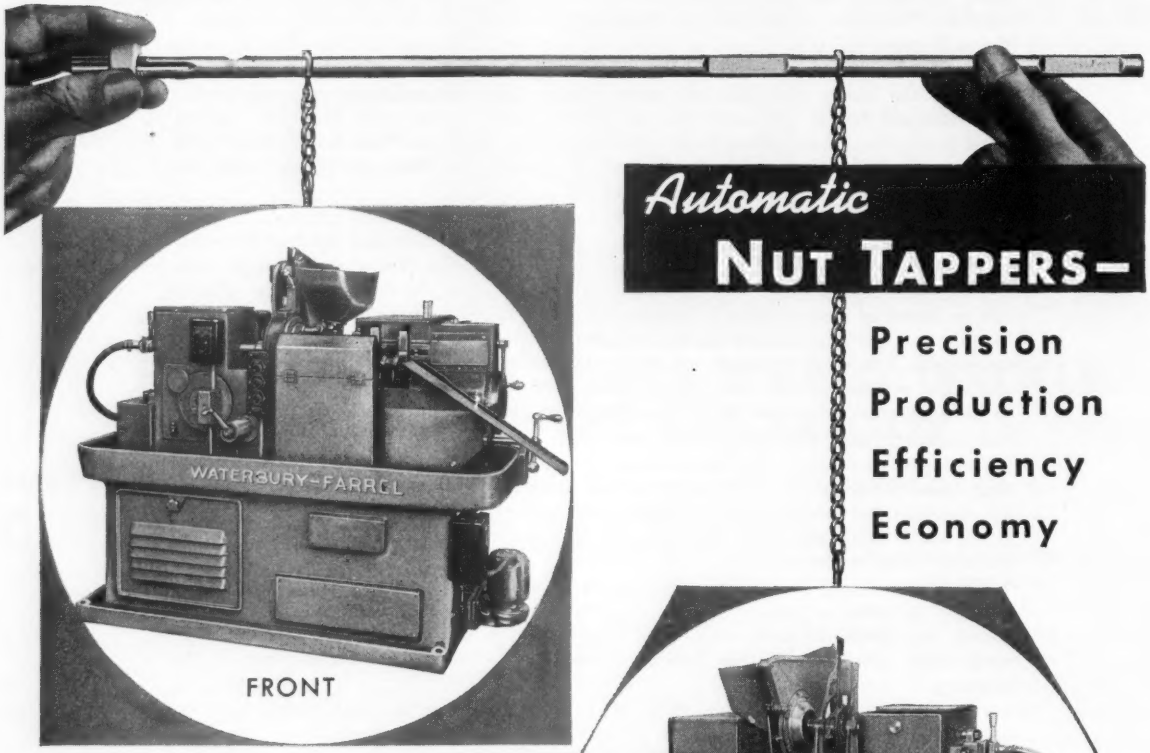
Considering the present high levels of business and the still unsatisfied needs of the consuming public, business should continue to be good. If we have a recession, it will probably be largely a psychological one, for the elements making for continued prosperity are to be with us for a long time to come.

—from the Editor's Desk

V 22/6

It all hangs on the—

Stationary Straight Shank Tap!



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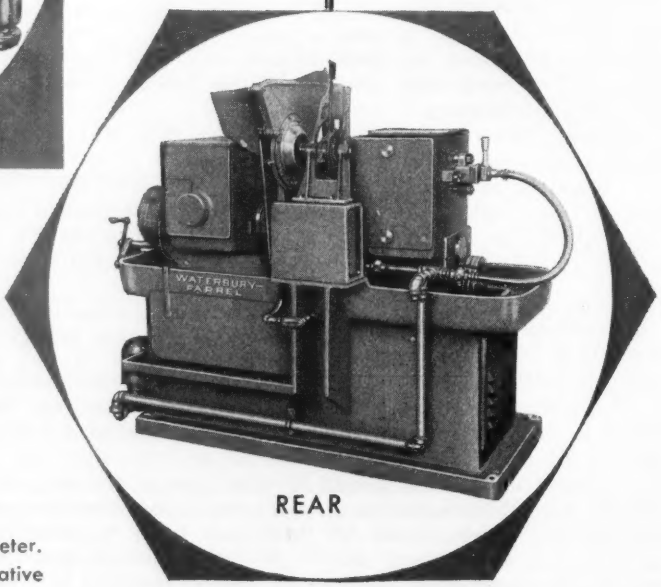

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WIRE AND WIRE PRODUCTS

A monthly publication devoted to the production of Wire, Rod and Strip, Wire and Rod Products and Insulated Wire and Cable.
DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

Vol. 22 JUNE 1947 No. 6

Designated as
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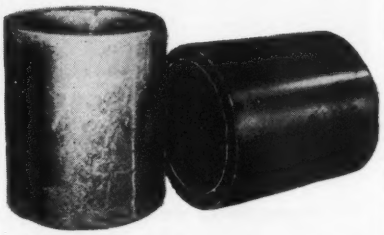

STEVENS Traverses can be used over and over. Some have given as much as sixteen years' service.

NUMBER of trips per reel increased 50% to 100% before cut-downs or scraping wooden reel heads.

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This difficult operation, —a one-draw, severe reduction, required a correctly designed die with Firthaloy for wear resistance in the hole, and hardened top face for wear resistance against wrinkling.

There's more to a good deep drawing die than simply a carbide insert in a steel casing. Firthaloy engineering skill based on past experience in the deep-drawing field; correct design based on established practice; proper selection of materials; accurate specifications to meet the individual needs of the case . . . are reasons why FIRTHALOY DIES assure size control, surface finish, trouble-free operation, long life and low die cost per piece.

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WIRE AND WIRE PRODUCTS

A monthly publication devoted to the production of Wire, Rod and Strip.
DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

Vol. 22 JUNE, 1947 No. 6

Wickwire Brothers at Cortland

by Kenneth B. Lewis,
Consulting Wire
Mill Engineer,
Worcester, Mass.

The second in a series of articles designed to perpetuate the history of the Wire Industry in America. The purpose of these papers is to perpetuate some of the history that otherwise might become lost or inaxcessable.

WIRE mills break down roughly into three classes. At the small end of the scale are the specialty mills, founded usually by one or more of the operating personnel of a larger plant, to exploit their technical skill and special knowledge. They start small, and as a rule they stay comparatively small, that is, small in terms of tonnage, though the dollar value of the product and the per cent return on the original investment tend sharply to increase.

* * *

AT the other end of the scale are those which start life as full sized plants, units of large steel companies seeking further outlets for their steel. The vital part of such a mill is the rod mill, usually for a capacity of the order of four hundred tons daily. Of this typically, about one quarter is sold and the rest put into the common wire products, fence, nails, and bale ties. Over the past twenty years most of these mills have been forced by circumstances into manufacturers' wire and specialties, including the high carbon grades, and as they enter this field the small plants find newer and more difficult specialties in which to capitalize on their special skills.

BETWEEN these extremes lies a class which includes plants started to produce a line of goods in which wire is a chief ingredient. Starting as purchasers of wire they are almost inevitably forced by circumstances into the production of wire for their own use. A large plant of this class is very apt to be pushed further, by a rod shortage arising out of the same basic factors which created the wire shortage, and the successive stages of rod rolling, billet rolling, and steel making often follow.

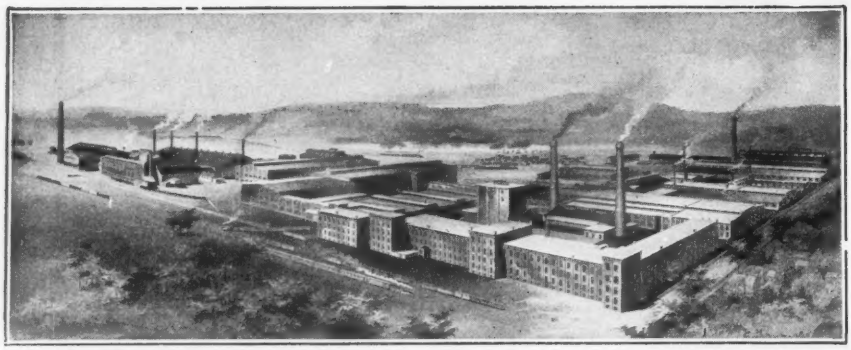
* * *

A typical example of the middle class was dealt with in these columns last month, the wire mill at Kokomo. **Wickwire Brothers, Inc.**, of Cortland, New York, is a still more striking example, since it started further back, and we mean further technologically as well as chronologically.

THE name **Wickwire Brothers** first appears in connection with a business enterprise in 1866, at which time it covered the operations of a small hardware store on the east side of Main Street in Cortland, where Chester F. and Theodore H. Wickwire were established. The germ of the enterprise which we know now as Wickwire Brothers lay in the acquisition in 1873, as an installment on a very dubious debt, of a second-hand carpet loom. Standing in the back room it was even less of an asset than the debt, and Chester, who was of a mechanical turn of mind, conceived the idea that wire screening, then imported from England, might be woven on this thing. The necessary changes were worked out; screen cloth was duly woven, to be sold locally, and as far away as Syracuse and Binghamton. This would have been the beginning of screen cloth manufacture in the country, had not the same thing taken place a short time before, at **Erastus Bigelow's** carpet mill in Clinton, Mass., and given rise to the **Clinton Wire Cloth Co.**

* * *

AFTER three years the brothers found that weaving and marketing wire cloth was taking all their



View of Wickwire Bros., Cortland, N. Y.

time. The hardware store was sold and in a set of small wooden buildings on Central Avenue they designed, built, and operated looms. Chester was the mechanic, Theodore the merchant.

* * *

IN 1881 a continual difficulty with the supply of fine wire led to the erection of a building on South Main St. and the drawing of fine sizes from process wire. Sieves and similar hardware items were added to the line at that time. In 1892 incorporation took place, under the name which has stood unchanged for eighty years. A year later the fine wire production was stepped up, and benches installed to draw from the rod. Chester's talents were again called into play; machines were designed and built for the weaving of hexagon netting. The Wickwire pattern was now pretty well established; one further step remained, a step which faced many a large independent wire producer in those days. For the benefit of the younger readers there should be a brief review of the rod and wire situation at the turn of the century.

* * *

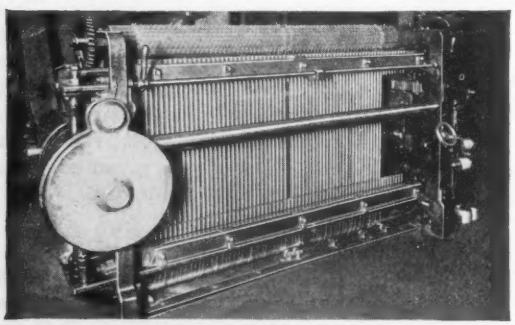
THIS was a period of storm and stress in the steel industry. Industrial behemoths were snorting and bellowing in the mercantile jungles; savage battles were under way, of which the general public knew nothing until the bodies were carried out. Specifically, the **American Steel & Wire Company** was being born, destined to be swallowed instantly by the **United States Steel Corporation.** I shall not attempt to detail the preliminary mergers that formed and broke like bubbles on the top of a boghole, leaving nothing but a bad smell and worse paper. The fact vital to the course of this narrative is that nearly every rod mill in the country was swept up into the new corporation, whose owners, to clinch their monopoly and drive the remaining independents into the corral, put the squeeze on them through wire rods.

EVERY evil carries within itself the seeds of its own destruction. For a generation the rod rollers of the country had kept a grip on the throats of the wire industry. With an arrogance worthy of a Petrillo or a Lewis, (John L., that is), they dictated terms and conditions, blocked off apprentices, built up family monopolies, drove fast horses, and swelled around in plug hats and tail coats. The roller's income usually exceeded that of the owner by several hundred per cent. Rod rolling was a secret process as well as a highly skilled trade.

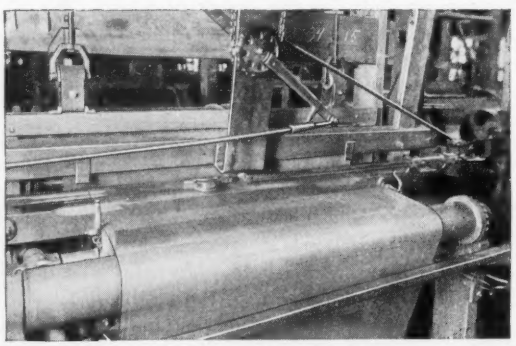
* * *

THIS intolerable situation had already been attacked through the medium of the continuous rod mill, invented by **George Bedson** in England, and improved at the **Washburn & Moen** mills in Worcester, **Charles Morgan** had left **Washburun & Moen** to set up an organization to exploit his familiarity with the new rolling system, and the situation which developed at this time was most emphatically up his alley. The **Morgan** mills were so easily mastered that the machinist who erected the mill at the customers' plant often stayed to start it up and break in a crew, and in many instances to become the head roller. Within a very few years the country was dotted with **Morgan** mills, and two monopolies were busted higher than a kite, that of the Corporation, and that of the head roller.

* * *



Fence Wire Weaving Machine



Screen Wire Weaving Machine

THE rod squeeze hit **Wickwire Brothers** in 1900, and the records show that their rod mill started up in 1901. But the Octopus had another trump to play, and within a few months there was a shortage of billets, which pinched not only **Wickwire Bros.** but all the other operators of **Morgan** mills. Up came not only the **Morgan** continuous billet mill, but several novel combinations of small steel plants and primary rolling processes. Free enterprise is hard to crush.

* * *

CHARLES Wickwire, now president, tells me he well remembers the German billets that were rushed in to fill the gap in 1902, pending the construction of the small steel plant by **Wellman-Seaver-Morgan.** This was the factor that forced **Wickwire Bros.** into the wire business as distinct from the netting business. The expansion was no part of their plans, but with a steel plant pushing stuff at you faster than the normal market can take it away in the form of woven products, there's nothing to do but put in some nail machines and similar units and become one of the big ones.

* * *

ONE of the labors of Hercules was the slaying of the Hydra, a most unpleasant beast, on whose neck, as soon as you cut off one head, two heads grew in its place. The Corporation swung the sword of monopoly at the independent wire producers who refused to come into the combine; every one of them put in a rod mill, and then, in order to keep the rod miil decently filled, had to triple its production of wire and eat into one of the Corporation's markets. This tone of quiet amusement is not to be construed as criticism of the policy of the Corporation. Things were different in those days, corporate ethics were on a low plane. The Founders doubtless thought most sincerely that the little fellows would be safer and happier under the big wing; Hitler made the same mistake, Stalin is making it now.

* * *

FOR twenty or thirty years after the turbulent times just described, things at Cortland ran a rather placid course. It was a rather placid time in the wire industry in general, with no revolutions in practice or in equipment. In 1907 there was a change in management; Theodore and his sons, T. H. Jr. and Ward, drew out and went to Buffalo to build a blast furnace, acquire an iron mine and lake steamers, and eventually to develope the **Wickwire Steel Co.** which later became a part of **Wickwire-Spencer.** Chester and his sons, Charles, now president, and Fred, who died in 1928, stayed in Cortland. There was never any business connection between the **Wickwire Bros., Inc.**, and **Wickwire Steel Co.** They had nothing in common but the name.

* * *

DURING the past twenty five years a slow revolution has crept through the wire mills. It started with the **Morgan-Connor** continuous wire drawing machine and the **Vaughn** motor-connected bull block, and was greatly accelerated by the carbide die. Contributing factors include the improvement and extended use of inhibiters, the development of straight-line cleaning, and of the flash baker. These factors worked on each other and their combined impact on the industry has resulted in the abandonment or extensive re-vamping of nearly every large wire mill in the country. **Wickwire Bros.** began to feel the movement in the late 1920's, and started experiments with **Morgan-Connor** machines.

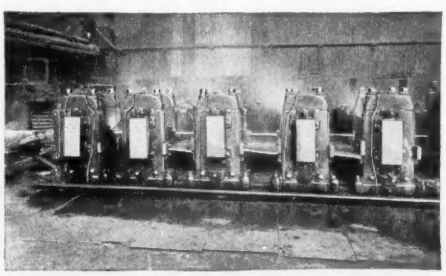
* * *

THE purpose of these articles is not only to entertain our readers but to get on paper some contemporary history that otherwise might become lost or inaccessible. Into this class falls the stories of the origins of the **Morgan-Connor** and the **Vaughn** types of drawing equipment, and this is a convenient time and place to record them.

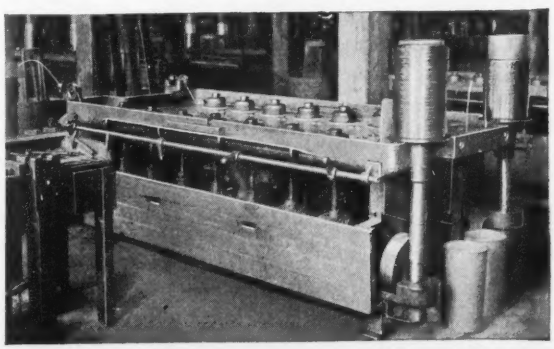
* * *

HARRY Rice, an old **Washburn & Moen** man with experience at Waukegan as well as at Worcester, took charge of rods and wire for **Dominion I. & S. Co.** at Sydney, N. S. In 1916 he was sent to England on business. This was in the middle of the first World War, and **Harry Rice** was rolling 1-1/4" shell rounds on his Morgan rod mill, believe it or not. He wrote to **Victor Edwards** of **Morgan Construction Co.**, describing and sketching a continuous wire machine that had been invented by **Robert Slinger**, and was being exploited in a small wire mill by **Slinger and Duncan Connor**, both of whom were former employees of **Richard Johnson & Nephew of Manchester.**

* * *



Battery of Furnaces



Wet Wire Drawing Machine

I was in charge of wire machinery for **Morgan**; the letter came to my desk, and practically set me on fire. I began to clamor for American rights, but wire machinery was small potatoes at Morgan's in busy times, and I got nowhere. But in 1919 I was sent to France and stopped in England long enough to confirm my suspicion that the problem of continuous dry drawing had been solved, and to get an option. After my return I succeeded in selling the idea to my superiors, and we redesigned and produced a trial machine, which we had on test throughout 1921.

* * *

IN 1921 **The Whitaker-Glessner Co.** of Portsmouth, Ohio, built a wire mill, under the supervision of **George Paff**, who had been secured from **Page** in Monessen, and who had previously served in Aliquippa and Sharon. After demonstrating the new process in Worcester I took George to England and we checked progress at the **Connor Slinger Wire Co.**, which drew exclusively in this system, and was going to town on netting wire. George was very favorably impressed, and ultimately put in machines for all three and four hole work, but he would have been keener had he not been nursing an idea of his own, none other than the direct connection of individual motors to wire blocks.

* * *

A number of such units were submitted to trial at Portsmouth, with different motors, controls, and transmissions, and they were tested most drastically. The type finally selected was a long-spindle unit with spur gear reduction and motor beneath the floor. There was nothing new about this idea, except the notion that the time had come to reduce the thing to practice. **Ralph Morgan** had drawn wire with a street car motor at the turn of the century, and before that **Joseph Bedson** had done it in England, and both had found no difficulty in reaching high speeds with the kind of start afforded by the characteristics of a motor.

LEE **Vaughn** had been much interested in the trials, and concluded, as had **George Paff**, that the time was ripe. He displayed some courage in picking worm gears, in the face of the fact that the worm gears of the test machine at Portsmouth had been chewed up in the first hour, but the results have vindicated his judgment. **Morgan** and **Vaughn** ran a very close race for a while, and when continuous drawing seemed definitely in the lead, **Vaughn** brought out the continuous units which we know as Motoblox. There is nothing new under the sun. I have a sketch made in 1908 by **Jerome George**, dated and witnessed as though for the patent office, showing individual motor drives and rheostat control through loops. Credit usually goes, and rightly so in most cases, not to the person who first conceived a thing, but to the one who risked his money and reputation making it practical.

* * *

WICKWIRE **Bros.** started, as I have said, experimenting with **Morgan-Connors** late in the 1920's. They are in process of replacing all the old equipment with modern stuff, both **Morgan** and **Vaughn**, with the former predominating. Straight-line cleaning has been installed, with flash baking. Annealing is gradually swinging over from the old-time pot to **Lee Wilson** bell with controlled atmosphere. Carbide dies came in, of course.

* * *

THE company's product is chiefly woven wire, screen cloth, hardware cloth, and poultry netting. A specialty within a specialty is glass netting, that small-meshed ultra-clean hexagon fabric which is cast into plate-glass as a reinforcement. Its manufacture raises some unique problems, discussion of which would be slightly out of order in these columns. The establishment of a steel plant forced the company into nails and market wire, both trending toward the smaller gauges. A generation ago **Wickwire Bros.** were known in the trade chiefly as the only people who had solved the mean problem of making weaving wire from basic steel. Bessemer was going out, and basic simply did not act right in the fine sizes, and no doubt more than one superintendent would have thrown up the sponge had he not known that Wickwire had done it, and therefore IT COULD BE DONE.

* * *

A good bit of bronze cloth is made at Cortland, and also a line of copper nails, which, however, is sold under the name of the copper producer rather than of Wickwire. The nail output in general runs into more than the usual amount of carton packing.

* * *

THE **Wickwires** now active at Cortland are all of Chester's branch. **Charles C.** is President, and his son **Charles** is active in the commercial side. Chester's son Fred died in 1928; his sons **Chester** and **Lyman** are in the technical side, the former being known to many members of the WIRE ASSOCIATION. **Harry Edick**, also well known in the technical side of Association affairs, is general superintendent, and **Mr. Wilkins**, who was a familiar figure at early meetings of the Association, although he is easing up a good deal, is by no means out of action.

* * *

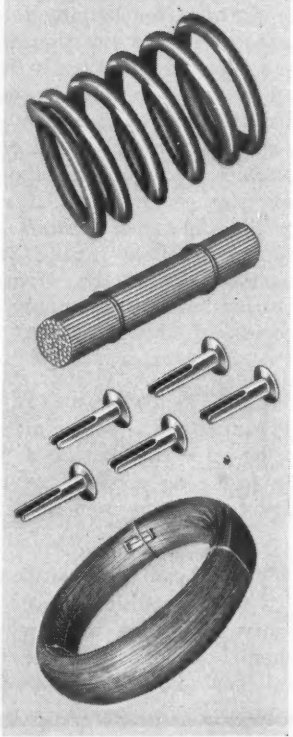
A word about the labor question seems in order. In early days, in fact in days not so darned early, the labor situation at Wickwire's was the envy of the wire world. The employees from top to bottom were local boys; they and their families were known personally by the founders. In fact when the brothers walked through the mill they habitually called every man by his first name, and they in turn were known and generally addressed as **The** and **Chet.** Grievances, if any, were thrashed out right on the spot, with all factors known to all parties. The dignity of every man was respected. If a wire drawer saw fit to take a few days off when the fish were biting, he never found a stranger at his blocks when he came back. Those blocks were regarded by the management as his place of business, and nobody touched his

(*Please turn to page* 463)

NEW METHODS AT OPEN HEARTH FURNACES PRODUCE J&L CONTROLLED QUALITY STEEL FOR WIRE

The uniform quality of all J&L wire products makes possible smooth, dependable performance in your twisting, swaging, crimping and heading operations. Your products made of J&L wire look better—sell quicker and stay sold longer.

The work of improving steel quality at J&L moves ahead constantly. For example, two devices developed by J&L research engineers are most effective in providing closer control of the open-hearth process. They invented the Carbanalyzer which provides a quick, accurate reading of the carbon content of a steel sample taken from the open-hearth during the progress of the heat. They have also found a means of measuring directly the temperature of the steel in the bath. Both of these controls are typical of the outstanding work done in every department at J&L—all directed toward producing Jones & Laughlin Controlled Quality wire products.



SPRING WIRE ARC WELDING WIRE FORMING WIRE LOCK WASHER WIRE
CHAIN WIRE TUBULAR AND BIFURCATED RIVET WIRE
WOOD SCREW AND MACHINE SCREW WIRE GALVANIZED WIRE

JONES & LAUGHLIN STEEL CORPORATION
PITTSBURGH 30, PA.

SERVICING OF DIES

Report from the Field

THE Trouble Shooter turned over the pages of his notebook: "Well, there's the story, Boss—that's the answer to the so-called die trouble."

* * *

"LET'S have it, Son", The Boss leaned back to hear first hand the report of his trained inspector.

* * *

"O K. — first, here's this wire factory in the midwest. We had a complaint that their dies were not giving satisfactory service, and that repair costs were too high. I took a good look at their repair section first. I'll say their repair costs were too high! Can you imagine this — this is what I saw: damaged dies were piled up at one polishing machine where they had to be run before the die man could determine what size they could be recut to. Then I talked to the foreman who would get the dies for lapping to a clean surface. He told me that the damaged dies were so badly fractured and burned up that it took days of application of fine diamond dust to salvage them. It was hardly ever possible to recut the die to the next size — and even after taking up the die several sizes, a weak spot or fracture in the stone remained so that the salvaged die deteriorated very quickly in the process of drawing wire."

* * *

"THAT'S bad", the Boss commented. "Wire men ought to be able to expect a repaired die to be as good as new. Didn't they have good men on the job?"

* * *

"THE best! That wasn't where the trouble was. I had a pretty good idea what was wrong when I took a look at the dies and saw how deeply worn and

The Industrial Diamond Association's Committee of Diemakers naturally turns to "Wire and Wire Products" as their organ, since practically all diamond dies are used in the drawing of wire, and this magazine is the cyonsure of all the eyes in the wire drawing industry. Accordingly, when the Committeemen felt that a service could be rendered to the wire drawing industry, and at the same time to their own manufacturers of dies, they evolved the text of a likely conversation between the field investigator for a die manufacturer and the manager, and sent it to "Wire and Wire Products" for dissemination. Here is the story:

scarred by burning they were. I could tell that something was wrong with the lubrication system. I found out what it was when the superintendent took me through the mill."

* * *

"DID he explain their inspection system to you?"

* * *

"WELL, yes and no. In the finishing section, he pointed out how careful they were to maintain a tolerance of from 1 to 3 tenths of one thousand, by a daily check on the finishing dies and removal of any dies showing wear. I asked to see the back dies and, as I expected, there I found the answer. What an answer!"

* * *

THE Boss smiled: "Dirty machines?"

* * *

"YES, some of the wire drawers did not keep the machines clean enough; the lubrication outlets were clogged and the die was not getting a constant flow. Part of the trouble came from variations in the lubrication mixtures; also, they were running too many alloys off the same lubrication system."

* * *

"NO wonder their dies were short-lived with such mishandling!"

* * *

"WHAT did you suggest to him?"

* * *

"I asked him to show his men how much better it would be to remove the dies as soon as they showed wear, so that recut could be made to the next size without a lengthy cleaning up. We ran into a hitch there; the mill's inventory was so low that immediate replacement with a matched set could not be made for all the worn dies. So the production manager and I sat down to do some arithmetic."

* * *

"WHAT do you mean?"

* * *

"WELL, we figured the costs of the labor and materials (diamond powder) in salvaging badly damaged dies, the cost in loss of "down time" when badly repaired dies ran only a few hours. The figures showed him that by immediate removal of worn dies enough saving could be made (in stopping lost time and die wastage, and in increased poundage through longer die life) to finance the buying of a good stock of dies instead of buying in small quantities only when there was an immediate necessity."

* * *

"THAT mill seems to have been in pretty bad shape!"

* * *

"YES, but I don't think they'll have any more trouble. That

Some Die Faults, Their Causes and Effects

A POOR DIE — Sharp front; too long; leaves poor, sharp, highsided back. This die will cause sucking and continual breaks. If it runs, will break out in back.

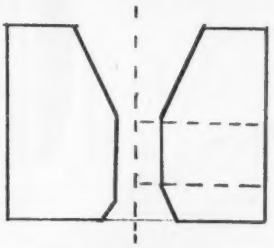
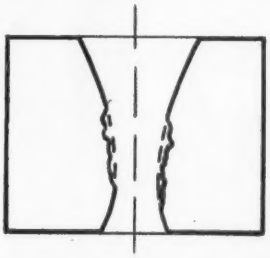


FIG. A



POOR LUBRICATION AND DIE HAVING BEEN LEFT IN MACHINE TOO LONG The life of this die has been halved even in the first draw. This can occur on one or both sides.

FIG. B

RING DEVELOPED IN FRONT AND BACK DURING WIRE DRAWING. — (A) This wear shows die having been left in machines too long. (B) Piece chipped out. — Either defect will require reshaping both back and front before further service can be obtained, short die life indicated.

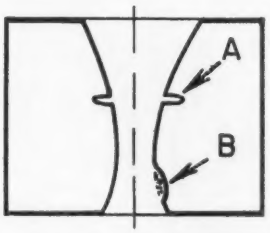


FIG. C

production manager is a smart fellow — and he got the superintendent to set up a daily inspection of back dies as well as of finishing dies, and ordered a good stock so replacements would not be held up. Few of the mills I visited were as bad in regard to the lubrication system as that one."

* * *

"WHAT kind of trouble did you run into in other places?"

* * *

"THERE was a mill in the East that complained about poor wire — they were blaming the dies. I found that their trouble came from different factors: nothing wrong with their lubrication system; they had a good stock, so they never put just any die in the string up. In fact, the superintendent knew how important uniform shape and polish is for various alloys and for the individual mill. He had a good system of making time runs to ascertain the best shape for the individual alloy, and the die department kept to these findings. The superintendent was a good die man; but he slipped up on checking all possible causes of short die life and a poor product. I found inclusions in the rod, faults in pickling, lack of uniformity in annealing, and rough capstans. No wonder the dies were so damaged that even poorer wire resulted. It's not often that you find so many material flaws in one mill."

* * *

"SO far your trip seems to have been rather discouraging!"

* * *

"ON the contrary. I found many wire production plants that were honeys. But I'll come to them later. I want to tell you about one more too common mistake in wire production. Here are my notes on a factory that reported high breakage of diamond dies. What do you suppose they were doing?"

* * *

"I think I can guess that one — any die man would look first to see if they were running carbides and diamonds in the same series."

"THAT'S exactly what they were doing, and of course the carbide wore oversize faster which put additional strain on the diamond and caused it to break. No, Boss, far from being discouraged by the bad conditions I found, I feel good because it was so easy to spot the trouble and get the superintendents to correct the source. Profit talks, and it has been talking to the wire manufacturers."

* * *

"YES, they certainly are profiting from an improved product. Most of them know from their own production costs that material and labor have gone up over 80%; yet they are not paying much more than they used to for a better product than they've ever had before. We can thank our experienced personnel and new war-developed equipment and techniques for that."

* * *

"RIGHT, Boss! And more and more of the plants I saw

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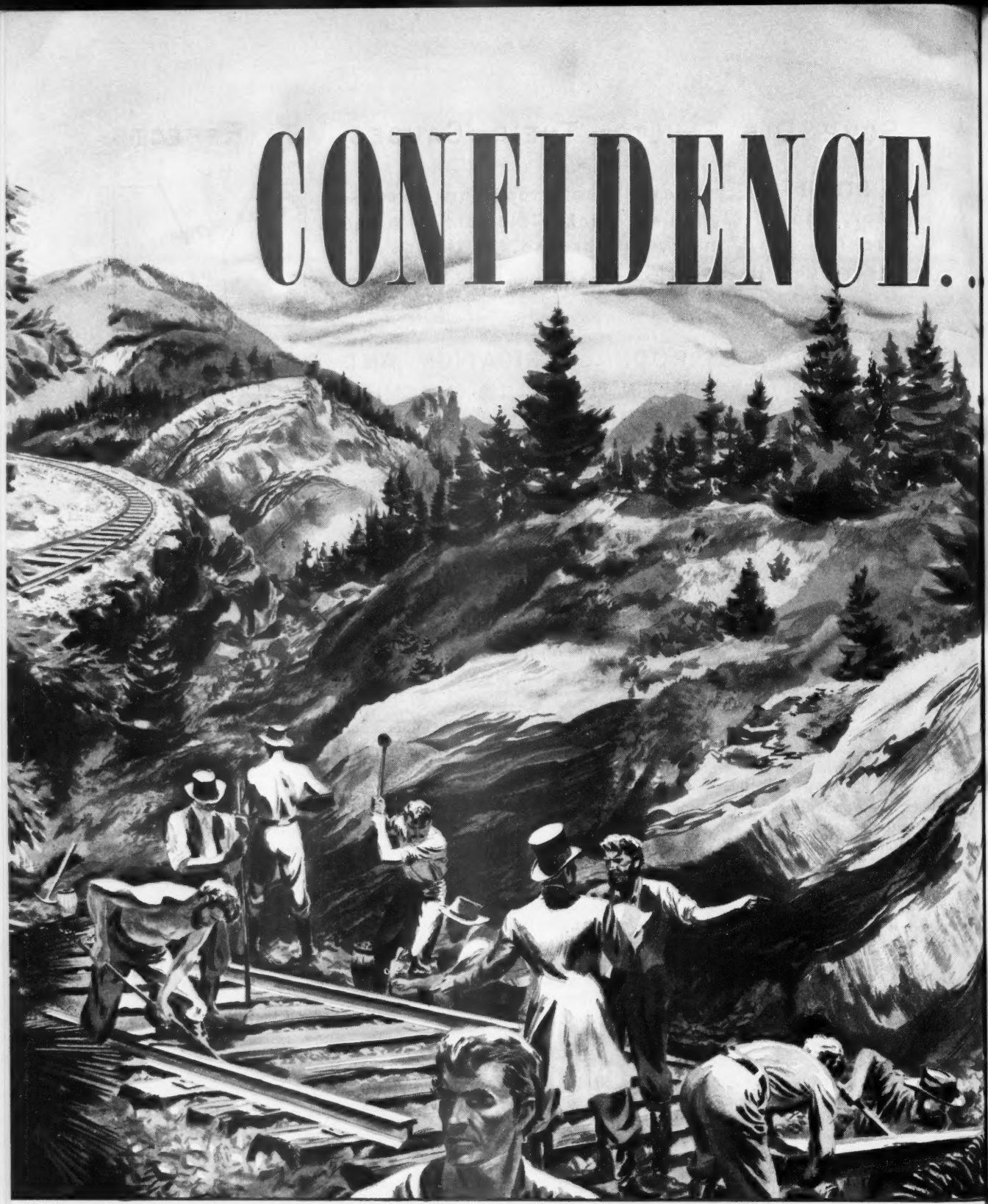

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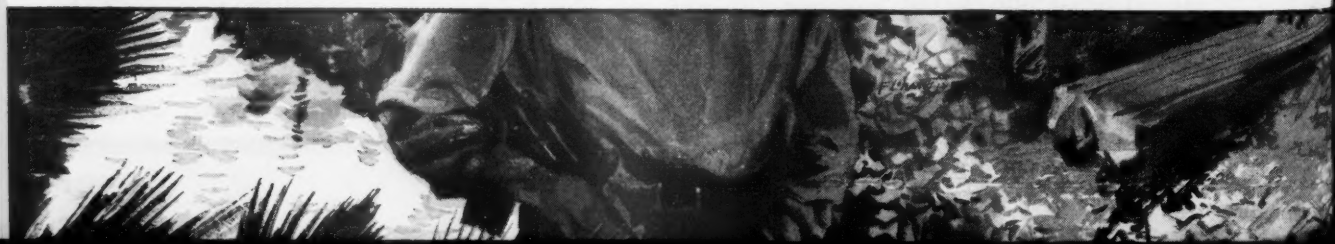

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E..... how much is it worth?

IN 1846, twenty three years before the Golden Spike was driven at Ogden, Utah marking the completion of the first transcontinental railway, John August Roebling built America's first truly practical, wire rope suspension bridge. This bridge, which carried traffic across the Monongahela River for scores of years, stood as a silent testimonial to his confidence in a principle of bridge building which, in that day, was looked upon with considerable misgiving.

How much is this confidence worth to bridge engineers, and to humanity as a whole, today?

Had it not been for his confidence there would have been no Brooklyn, George Washington nor Golden Gate Bridges. Had it not been for your confidence in the company that bears this pioneer's name, there could have been no John A. Roebling's Sons Company.

Your confidence is valued above all of this company's assets. Every Roebling employee's job depends upon his ability to preserve that confidence by producing better products and by giving you better service than you can find elsewhere.

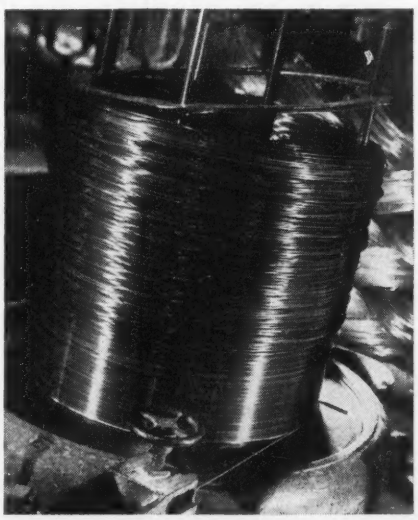
Any product is only as good as the organization that makes it.

FOR SOMETHING "SPECIAL", SPECIFY ROEBLING WIRE

IT MAY BE a new application for wire . . . or specifications calling for a unique combination of wire qualities. Whatever it is, if you're looking for something "special" in wire, call on Roebling.

Many a new product owes its success to the right wire—made especially for the purpose by Roebling. And it's natural that designers as well as manufacturers think of quality wire as synonymous with Roebling. A pacemaker in wire products for over a century, Roebling has the craftsmen and equipment, the research and engineering facilities, to tackle practically *any* wire problem.

Your Roebling Field Engineer, equipped by training and wide experience, can offer many valuable suggestions on production short-cuts and savings even in the early stages of the development of your new product. He'll gladly consult with you. Call him at our nearest branch office.



JOHN A. ROEBLING'S SONS COMPANY
TRENTON 2, NEW JERSEY
Branches and Warehouses in Principal Cities

Electrical Wire and Cable • Suspension Bridges and Cables
Aircord, Aircord Terminals and Air Controls • Lawn Mowers

ROEBLING

A CENTURY OF CONFIDENCE

Wire Handling With Industrial Trucks

Improved handling for Talon, Inc. through the use of storage battery powered industrial trucks. An outline of the method used is given here.

FACED with the necessity, some ten years ago, of devising better methods of warehousing supplies of bronze, nickel and aluminum wire and strip, as well as supplies of fabrics, tapes and cord used in the manufacture of its slide fasteners, **Talon, Inc.**, Meadville, Pa., acquired two storage battery-powered industrial trucks and placed them in operation. An immediate improvement in the method of handling material from receipt, through the stores department and into production was noticed.

* * *

THE first two trucks — still in use at Plant No. 7 — were a lowlift platform truck of 4,000 pounds capacity, and a highlift, fork-lift truck of 2,000 pounds capacity. In 1941 another battery-powered fork-lift truck, of 1,875 pounds capacity, was placed in operation. Both fork trucks have a lift of 108 inches, sufficiently high to permit tiering supplies at the extreme height of a series of specially constructed racks erected adjacent to the five-car, railroad spur track which is run into the warehouse. The old warehouse, the facilities of which proved insufficient to accommodate all of the articles carried in the stores department, was replaced, about a year ago, with a new three-story concrete and steel structure with all of the newest warehousing devices needed by the company.

* * *

WITH the construction of the new warehouse one of the fork-lift trucks has been moved into the production department at Plant No. 7, in the area devoted to the manufacture of the sliders and wire for scoops, as the teeth of the fasteners are known in the plant. It is planned to make further use of battery-powered trucks in the production department, but this move is awaiting a re-organization of the material handling system.

* * *

AT present the 1,875-pound capacity fork-lift is being used in production for moving skid and pallet loads of wire and strip in the rolling, stamping and storage areas; also for the handling of specially constructed scrap barrel skids, and for miscellaneous duties.

* * *

WIRE, in coils, is placed adjacent to the operators of the stamping and shaping machines, in supplies sufficient so that there is no necessity for any 'down time' by the machines due to lack of material. The material also is moved from process to process by the same truck.

(*Please turn to page* 453)

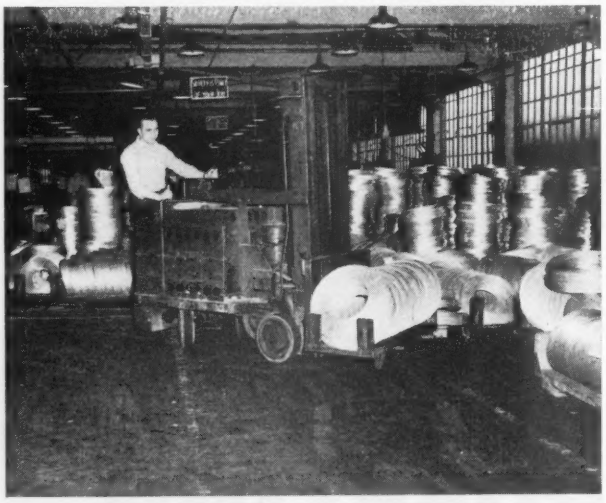


Fig. A — Semi-finished aluminum wire, used in manufacture of scoops, as teeth of slide fasteners are shown, in production area at plant. Weight of load of wire shown in this picture is approximately 800 pounds. Load is being taken to final rolling operation. Considerable savings in man-hours is reported, through use of battery powered trucks for movement of material, from time of receipt aboard freight cars, through process into final shipment. Machines are kept constantly supplied with material in such quantities that "down time" due to material lack, has been reduced to minimum. * * * * * *

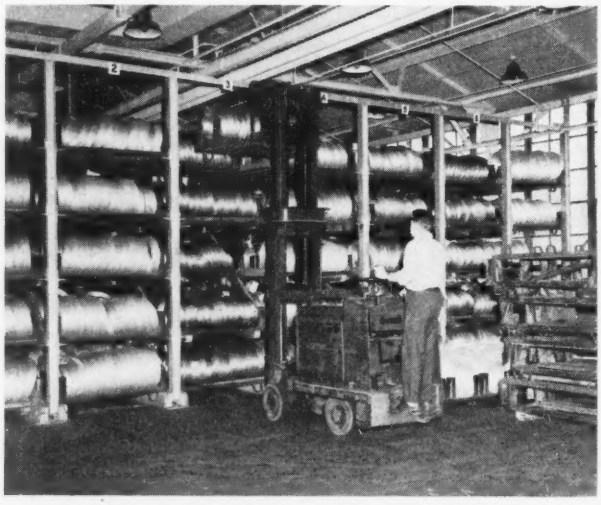


Fig. B — Storage battery-powered, highlift fork truck removing skid with 600-lb. load of finished nickel scoop wire, from storage rack for movement into chain machine department at Plant No. 7. All movement of weighty loads of material is performed by similar trucks, from time of receipt, through process flow into outward shipment.

LABOR RELATIONS

by John B. Stone
Washington, D. C.

The second of a series of articles on the subject, with particular reference to problems of the wire and wire products industry. The author is a noted authority on the subject.

THE talks held recently at Washington between representatives of the American Federation of Labor and the Congress of Industrial Organizations highlight a trend which may have profound effects upon the labor relations of every manufacturer in the United States, particularly medium sized producers of wire and wire products.

* * *

REGARDLESS of the immediate concrete results of the conferences here, the "ground swell" in the rank and file of most AFL and CIO unions demanding unification of the American labor movement into one big federation, is of significant dimensions. Most well informed observers are convinced that within a few years (perhaps as few as two or three) there will be one big federation including a membership of at least 15,000,000 organized workers.

* * *

FACTORS which lead to this conclusion include two facts: (1) that in more than sixty industrial centers AFL and CIO unions already had set up machinery for cooperation before the Washington meetings were scheduled and (2) the actual meeting of Philip Murray, president of the United Steelworkers of America and also of the CIO and John L. Lewis, president of the AFL United Mine Workers of America and founder and former head of the CIO.

* * *

THERE is little doubt that the rank and file movements for organic unity will continue to grow whether the ten men at the top of the two big federations make concrete progress or not.

* * *

THAT Lewis and Murray shook hands (even though with no hint of cordiality between them) is of equal importance with this "ground swell". Personal hostility of the most intense kind had marked their actions during the previous six years. To veteran observers here the fact that they were able to sit in the same room together and work at agreement meant that their desire for unification of the labor movement means more to them than personal feelings no matter how intense.

* * *

JUST how much the picture has changed in the last year or two becomes apparent when it is recalled that the Chamber of Commerce of the United States was brought to a standstill in its plans for a national labor-management board when William Green, president of the AFL, refused to sit at the same table with Murray.

* * *

YET at the Washington unity conferences Green and Murray not only worked together but held joint press conferences on a basis of complete equality. This was as much of a retreat for Green as shaking hands with Lewis was for Murray. Until the current negotiations were undertaken Green had always maintained that the CIO must return to the "house of labor" as a repentant "prodigal son".

* * *

NO one here is inclined to underestimate the serious obstacles which remain in the path of unification. Certainly Lewis will not allow Murray to become head of a united federation and visa versa. Some new and younger leader would have to be agreed upon for that position.

* * *

NOR are the problems of jurisdiction easy to overcome. Most rampant of these is District Fifty of the United Mine Workers which has invaded a dozen fields regarded by CIO unions as their exclusive property. The teamaters' union headed by Daniel J. Tobin of the AFL has been engaged in jurisdictional conflicts little short of open warfare with the CIO Brewery Workers and the Food Tobacco and Agricultural workers, another CIO union.

* * *

BUT District Fifty which still is colliding almost daily with other AFL unions proved no serious obstacle when Lewis last winter made up his mind to return to the American Federation of Labor and it is beyond doubt that Lewis would sacrifice it again if other obstacles to unity were removed.

* * *

PERHAPS the most serious problem is the aggressive stand of the AFL against Communists and "fellow travelers" in the labor movement. A great many CIO leaders as well as their "opposite numbers" in the AFL regard unification as a means for furthering the anti-Red campaign. This has put CIO unions of the left on the alert. But Albert J Fitzgerald, president of the United Electrical and Machine Workers is a member of the five man CIO negotiating committee and other left wing CIO leaders such as Harry Bridges of the west coast longshoremen and warehousemen have asserted that they can take care

(*Please turn to page* 465)

Wire Association Elects Officers

Discussions at the Directors Meeting of the Wire Association April 1947. Officers: Elected — Convention Program Discussed — Description of Meeting.

THE semi-annual meeting of the Board of Directors of the Wire Association was held at the Waldorf Astoria Hotel, New York on Friday, April 18th, 1947. At this meeting the following new directors who were elected in January were seated; **Mr. C. H. Hannon**, Metallurgist, Works Laboratory, General Electric Company, Pittsfield, Mass.; **Mr. Ralph B. Roth**, Vice-President, Ludlow Saylor Wire Company, St. Louis, Mo.; **Mr. Allan Dove**, Works Supt., Steel Company of Canada, Ltd., Montreal, Canada; **Mr. L. C. Crewe**, Works Manager, Johnson Steel & Wire Company, Worcester, Mass.; **Mr. Curtis Voigtlander**, Supt,. Wire Mills, Union Wire Rope Company, Kansas City, Mo.

* * *

IN this connection three of these directors were appinted by the president to fill the unexpired terms of the following: **Mr. N. C. Harrison**, resigned because of retirement from active business; **Mr. John C. Callaghan**, resigned because of retirement from active business; **Dr. S. F. Braley** engaged in other business than wire.

* * *

THE semi-annual report of the secretary and treasurer was presented and discussed at the meeting revealing that the association had 636 members and a cash balance of $636.44 on hand. The directors expressed themselves as being well pleased with the secretary's report and financial statement and commended his activities during the year.

* * *

A committee was appointed to select the Mordica Memorial Lecturer for the 1947 Convention. This committee consists of: **Mr. D. D. Buchanan**, Manager of Operations, Union Drawn Steel Division, Republic Steel Corporation, Massillon, Ohio; **Mr. C. E. Johnson**, Supt. Rod and Wire Mills, Bethlehem Steel Co., Sparrows Point, Md., **Mr. Ernest W. Clark**, Consulting Engineer Syncro Machine Company, Perth Amboy, N. J. and **Mr. Sidney Rolle**, Asst. Secy., Scomet Engineering Company, New York, N. Y.

* * *

DR. F. R. Morral, Metallurgist, American Cyanamid Company, Stamford, Conn., chairman of the Program Committee for the 1947 Convention presented a completed program for the October meeting, consisting of technical papers, two plant inspection trips; a symposium on world wide conditions in the wire industry with official contributions from many countries; a synposium on the condition and outlook of the wire industry in the United States together with other added features.

* * *

IT was decided that the technical papers would be preprinted in the October issue of WIRE AND WIRE PRODUCTS and that the foreign and domestic survey reports would not be printed until after the meeting.

* * *

THE following officers for the 1947-1948 term were unanimously elected: President, **Mr. R. M. Hussey**, Supt., Jones and Laughlin Steel Corporation, Aliquippa, Pa.; Vice-President Ferrous Division, **Mr. Leroy D. Seymour**, Mfg. Mgr., Rope and Wire Fabrics Div., John A. Roebling's Sons Co., Trenton, N. J.; Vice-President Non-Ferrous Division, **Mr. H. B. Carnahan**, Works Manager, Canada Wire & Cable Company, Ltd., Toronto, Canada; Secretary-Treasurer, **Mr. Richard E. Brown**, Publisher, WIRE AND WIRE PRODUCTS, Stamford, Conn.

* * *

FOLLOWING the directors meeting there was a luncheon with between 40 and 50 present at which the speaker was **Dr. Allen Stockdale**, Dean of Speakers of the National Association of Manufacturers. Dr. Stockdale spoke on Labor Relations with particular reference to the necessity for the education of the worker as to the company policies and company finances. The address was logical, well thought out and brought out many interesting points for management to use in its negotiations on labor relations.

* * *

DR. Stockdale delivered a most interesting and inspiring talk which was greatly appreciated by those who heard him.

* * *

AFTER the meeting there was considerable discussion on this subject and a most interesting reaction as to the desirability for more specific details to be furnished by manufacturers as evidenced by the following abstract from a letter written subsequent to the meeting.

* * *

"This is my complaint against the N. A. M. and the large corporations in general. Let me start by identifying myself. I am not one of those timorous mice who think the Wagner Act ought to be modified. I KNOW it ought to be REPEALED. I am not one of those who blame the mess we are in on the greed of the labor leader and the stupidity of the worker. The labor leader is of the type created by the situation; as for the worker, if he

(*Please turn to page* 455)

Worcester Regional Meeting of the Wire Association

An old-timer's night developed interesting information on the origin and development of the Johnson Steel & Wire Company, the George F. Wright Steel & Wire Company and the Wickwire-Spencer Steel Corporation.

THIS annual gathering was attended by about ninety men at the Sheraton Hotel in Worcester on April 11th. It was billed as "Old Timers' Night," and chairman **Tatnall** introduced as speaker **Kenneth Lewis** who reviewed the history of several of the local wire companies. **Mr. Lewis** reported that the editor of WIRE & WIRE PRODUCTS had asked him to write up some of the leading wire mills of the country, with special reference to their early history, and to the personalities connected with their development. The mills around Worcester naturally would bulk rather large in any such account. Much of the interesting detail surrounding the early struggles of these projects, said Mr. Lewis, was gradually slipping away, as one after another of the old-timers died, and unless we took pains to collect the data and get it recorded promptly there would be nothing left for our descendents but a drab list of officers, dates of incorporation, and the like. He appealed for cooperation in the task of gathering this material, and as an example of the sort of thing that was in danger of being lost, he sketched the stories of some of the local wire industries.

* * *

ONE of the most interesting stories is that of the **Johnson Brothers,** who started no less than three plants. It opens about 1913, when Dave Johnson, who, with his brother Bernard and his father Oscar C. Johnson, head of the music wire department, were working for Spencer Wire Co., decided that working for wages was never going to get him where he wanted to go. He decided to build a wire mill of his own. When he disclosed the plan to his father, he was told very firmly to drop the idea and never so much as mention such a crazy notion again. He never mentioned it again.

BUT Johnsons are stubborn people. What Dave did was to build a hen-house on a swampy piece of ground behind the house, such a hen-house as no hens had enjoyed up to this time, a hen-house with foundations and roof beams strong enough for a machine shop. The hens strolled in and out the back door, but just inside the door was a partition, and behind that partition, back of whitewashed windows, Dave and Ben slowly but surely built a wire mill. Working nights and week-ends, whittling out patterns, getting castings from out-of-town foundries, smuggling supplies into the place in the dark of the moon, building what they could and buying what they must, in the course of a couple of years they actually got a mill into production without a leak.

* * *

DAVE says his father undoubtedly knew what was going on, but was too stubborn to speak. Orders were secured under an assumed name. The boys gave their notice at the mill one Friday, and then worked right through till Sunday night, by which time they had finished wire coming through onto the finishing blocks. Then they called old Oscar Johnson in. He looked at the diamond polishing machines, he looked at the little double-lead patenting unit, he felt of the wire on the finishing blocks. Dave finally spoke up. "What do you say, dad, **Johnson & Sons?**" The old man nodded slowly, and next day put in his notice.

THE little plant prospered; the family built up a reserve, and in a few years started the plant that became Worcester Wire Works. Here trouble developed. This plant was built rather bigger than the family budget would stand; the project was incorporated and outside capital called in. On the death of the elder Johnson the balance of control shifted and the boys lost their mill. The financiers urged them to stay on, and offered the most attractive contracts, but having tasted control the boys couldn't see anything else. They sold out at a heavy loss, and then put their heads together to figure out the future. There were three of them now, George having got out of school and joined the party.

* * *

THERE never was any question that they were going to start another mill, the only question was how. At last they bought a machine shop and started in building their wire benches, located a suitable site on Wiser Avenue, and the rest is history. **Johnson Steel & Wire Co.** needs no introduction in wire circles.

* * *

MR. **Lewis** spoke also of the **Wright** wire industries, past and present. **George F. Wright** was master mechanic for the **Clinton Wire Cloth Co.** from 1862 to 1882 during which time he made many contributions to the art, including the first hexagon netting machine. He left Clinton in 1882 and after looking around a bit built a mill and installed his looms at Palmer, beside the **Palmer Wire Works.** A few years later he had to take over the wire company which had got into difficulties, and as the local bank could not satisfy his requirements as to credit for expansion, he shifted the looms to Worcester, and for some years made wire in

(*Please turn to page* 457)

GOVERNMENT WIRE PRODUCTION INFORMATION

Coaxial Submarine Cable

MANUFACTURE of coaxial submarine cable using polystyrene tape to hold the inner conductor and to insulate it from the outer conductor is described in a report now on sale by the Office of Technical Services, Department of Commerce. The cable was developed in Germany for high-frequency carrier telephony.

* * *

THE report, prepared by R. A. Goodman for OTS' technical industrial intelligence division, is based on interviews with officials of the Norddeutsche Seekabelwerke A. G. at Nordenham — the company that manufactured the cable.

* * *

ONLY two communication channels of polystryene-insulated cable were actually laid during the war. Both ran across the bottom of the North Sea: one between Arendal, Norway, and Hirsthals, Denmark; and the other between two German areas — the port of Ouxhaven on the mainland and the island of Heligoland.

* * *

THE Arendal-Hirtshals cable is 125 kilometers long and at some points lies 2,100 feet under water. The Cuxhaven-Heliogoland cable is shorter — 75 kilometers — and runs through shallower waters. No undue difficulty arose in the laying of either of the cables, the report states.

* * *

IN manufacturing the cable a specially-designed machine spins a tight helical coil of 40 or more layers of narrow polystyrene tape around an inner conductor of solid copper or copper-clad steel. The same machine then covers the coil with four overlapping layers of wider polystyrene tape. Eight copper tapes butted together in a long lay over the polystyrene insulation from the outer conductor.

* * *

IF the cable is to be used at depths greater than 450 feet, the outer conductor is wrapped with pressure-resisting tapes of hard steel. It is then bound with two thicknesses of linen or acetate tape and sheathed in lead. Layers of impregnated jute and galvanized mild steel armouring wires are usually wound around the lead sheath to protect it from mechanical injury.

* * *

AT frequencies greater than 30 kilocycles, the characteristic impedence of polystyrene insulated cable is 70 ohms or less. The attenuation factor at 150 kilocycles amounts to about 60 millinepers per kilometer; and the capacity between the outer and inner conductors, about 0.055 microfarads per kilometer.

* * *

MICROMETER PRECISION — MICRO-WELD — TRADE MARK REG. U. S. PAT. OFF.

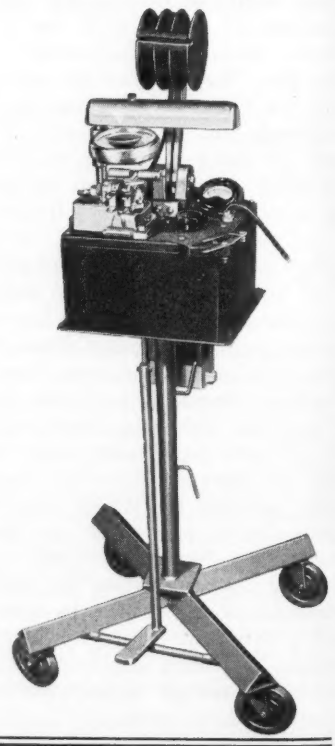
MODEL M-T MICRO-WELD BUTT WELDER

This welder was designed and developed expressly for welding all types of fine wire: Aluminum, Copper, Brass, Bronze, Steel and Steel Alloys, ranging in size from .005" to .020" diameter.

Unit design of frame, transformer and power sub-assemblies permit other range of sizes to suit requirements.

Equipped with a temperature indicating annealing and tempering device, voltage regulator and meter to compensate for voltage fluctuation, wire cutters, extra large 5" diameter magnifying glass, fluorescent light and extension cord. Welder can be supplied for bench mounting, or mounted on 4-wheel truck.

The adaptability of this unit for welding all types of wire, either ferrous or non-ferrous, in sizes from .005" to .020" diameter, make it ideal for the fine wire manufacturer.



MICRO PRODUCTS COMPANY

20 NORTH WACKER DRIVE, CHICAGO 6, ILL.

Telephone, State 7468

THE report (PB-49270; **Styroflex-Spiral Submarine Cable;** photostat, $2; microfilm, $1; 26 pages including illustrations) contains engineering drawings of the special machine used in winding the polystyrene tape around the inner conductor and diagrams showing the step-by-step procedure for joining lengths of cable together. Also included in the report are factory specifications for coaxial cables with and without pressure-resisting steel tapes and graphs of the attenuation factor and of characteristic impedence at various frequencies.

Recovery of Metals

THE Germans simplified and improved the recovery of precious metals from scrap metal and nickel refinery residues by applying ingenious variations to well known basic processes, according to a report now on sale by the Office of Technical Services, Department of Commerce.

* * *

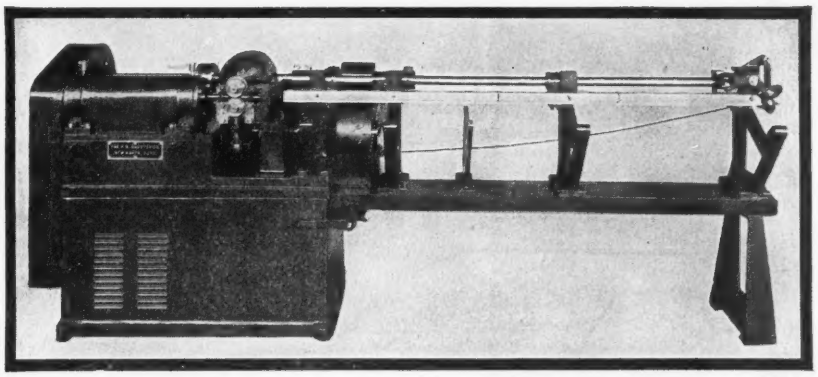
The report on precious metal refining and fabrication in Germany was prepared by OTS investigator Joseph S. Smatko, a member of the Columbia University chemistry staff. Mr. Smatko visited two of the leading German firms in this field, W. C. Heraeus and G. Siebert, Hanau, Germany.

* * *

THE report describes the entire German process for recovery of the platinum group metals — platinum, iridium, palladium, ruthenium osmium and rhodium. Most of the procedures observed are used in the United States but a few significant highlights are of interest to American refiners, the report states.

* * *

THE Germans do not consider the usual soda and lye precipitation processes efficient in the separation of iridium and ruthenium. Better results are obtained with hypochlorite method developed by Professors E. Mylius and A. Mazzuchelli, according to the report. The hypochlorite method is claimed to be especially good in the winning of platinum and ad-



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STRAIGHTENER SPECIALISTS FOR OVER 80 YEARS

Some of the refinements developed in that time—

Almost continuous wire travel
Lightening cut-off that assures square ends.
High-speed, direct-driven 5-die straightening flier
Quiet, efficient V-belt drive
Ball & roller bearings thruout
Extreme rigidity
Types for capacities from 1/32" to 11/16" diameter

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THE F. B. SHUSTER MFG. CO., INC., NEW HAVEN, CONN.
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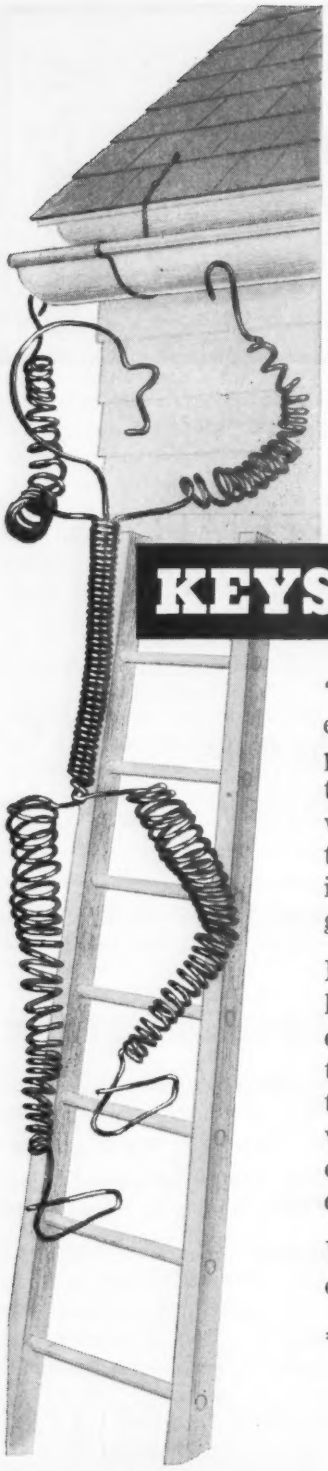
Automatic WIRE STRAIGHTENING AND CUTTING MACHINES



"FAULTLESS"*

eave trough hangers made of

KEYSTONE WIRE

"Faultless" eave trough hangers are easy to install, and are built to stay put. The double-twist stem and triple-twist backbone hold the eave trough where it belongs . . . and keep it there. A heavy silver-bright galvanized coating resists the elements, giving years of rust protection.

Naturally the wire used in "Faultless" wire hangers must be extremely ductile and uniform to withstand tight twisting, yet sufficiently stiff to hold its shape. Keystone wire provides these qualities — qualities that count so much toward manufacturing efficiency.

Whatever the wire need, Keystone can normally supply it.

*Klauer Manufacturing Company, Dubuque, Iowa

KEYSTONE MUSIC SPRING WIRE

KEYSTONE STEEL & WIRE CO. PEORIA, ILLINOIS

SPECIAL ANALYSIS WIRE for all industrial purposes

KEYSTONE STEEL & WIRE COMPANY
PEORIA 7, ILLINOIS

mixed related metals when base metals are also present.

* * *

THE report discusses products manufactured from the refined metals and alloys, such as spinnerette metals, metal powders, pen point alloys, contact alloys and jewelry and dental preparations. Electroplating baths of palladium, rhodium and platinum, and the production of mirror coatings by high-vacuum evaporation of rhodium or aluminum are described in detail because of special interest expressed by American manufacturers, the report states.

* * *

THE report (PB-44661: **Precious Metal Refining and Fabrication;** photostat, $2; microfilm, $1; 27 pages; dated April 1946) includes photographs and drawings of vacuum evaporation equipment.

* * *

ORDERS for this report should be addressed to the Office of Technical Services, Department of Commerce, Washington 25, D. C., and should be accompanied by check or money order, payable to the Treasurer of the United States.

Electroplating

THE quality of electroplating is greatly influenced by the size and shape of anodes and the method of manufacturing according to a recent German technical monograph now on sale by the Office of Technical Services, Department of Commerce. The report discusses the composition and use of anodes and gives corrective measures for troubles caused by improper use.

* * *

THE 35-page paper (in English) was written for the Field Information Agency, Technical, Office of Military Government, by Edmund R. Thows, a German consulting engineer.

* * *

ANODES are able to fulfill their two main tasks — to conduct current into the electrolyte and to maintain the metal content of the electrolyte as uniformly as possible — only if their chemical and physical properties are perfectly adapted to all requirements of the

plating system, the report states. Among the important factors determining the usefulness of anodes, the following are stressed: size, shape, purity, solubility, method of fabrication (casting, rolling, hammering, extrusion, etc.), and susceptibility to polarization or formation of slimes and crusts.

* * *

ALTHOUGH technical literature contains very few publications devoted entirely to the properties and uses of anodes, they are just as important as electrolytes and other constituents in determining the success of galvanic systems.

* * *

THE report discusses the correct use of copper, brass, nickel, chromium, zinc, cadmium, tin, lead and gold anodes, and includes a technical bibliography following the section on each of these metals.

* * *

ORDERS for the report (PB-47010: **Anodes;** photostat, $3; microfilm, $1; dated July 1946) should be addressed to the Office of Technical Services, Department of Commerce, Washington 25, D. C., and should be accompanied by check or money order, payable to the Treasurer of the United States.

Electrical Symbols Standardized

A "master" standard covering symbols used in drawings employed in wide sectors of the electrical field is now ready for distribution by the American Standards Association.

* * *

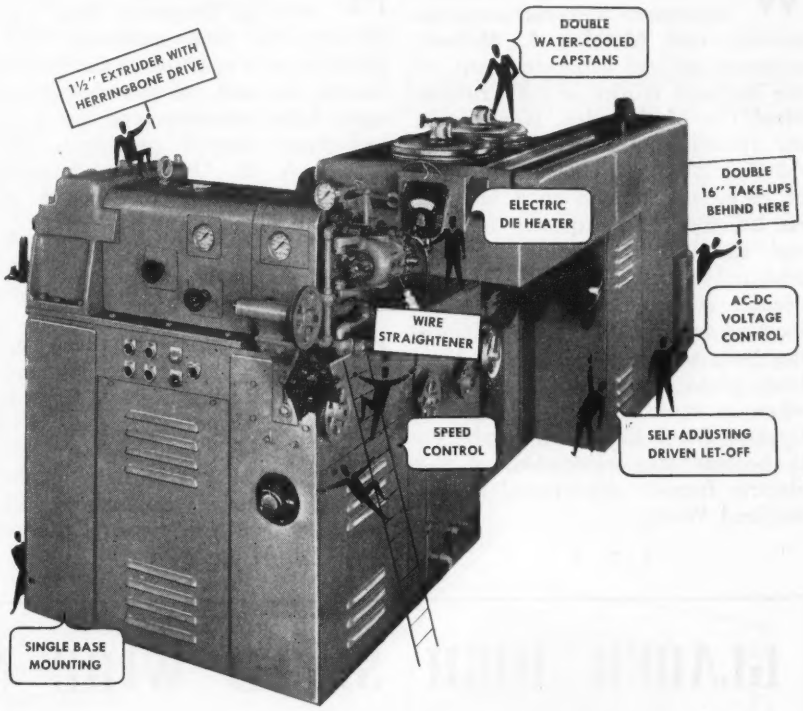
THE new standard, "Basic Graphical Symbols for Electric Apparatus", known as American Standard Z32.12-1947, was sponsored by the American Institute of Electrical Engineers and the American Society of Mechanical Engineers.

* * *

SOME of the classes of symbols treated in the new standard include those covering the electronic, thermionic and cold cathode fields, and photo-emissive tubes, transformers, inductors and capacitators.

Anyway you look at it...

This 1½" (NRM) Wire Covering Unit Sparkles With Features



SPACE here is too limited to completely describe the unit above. But you can see for yourself... its clean, compact design... only 13 feet long. What you can't see is its versatility... its great performance on smaller diameters of wire at speeds up to 800 feet a minute. If you want to add a great little unit to your wire covering capacity, you'll need more information of course... just drop us a line, today.

NRM

Plastics Machinery Division

NATIONAL RUBBER MACHINERY COMPANY

AKRON 8, OHIO

Outstanding Personalities of the Wire Industry

Crucible Steel Appointments at Midland Works

WILLIAM R. Howell has been appointed general superintendent and **Mathias J. Meinen**, assistant general superintendent, of the Midland Works of the **Crucible Steel Co. of America**, New York. Mr. Howell has been affiliated with the Crucible plant since 1921, when he came to Midland as a laborer. He became chief inspector in 1928 and in 1936 was made superintendent of inspection. In 1944 he became superintendent of both inspection and metallurgy. Mr. Meinen has been an executive of the Midland plant since early in 1940, when he came from the Universal-Cyclops Steel Corp., in Pittsburgh to become supperintendent of the electric furnace department at the Midland Works.

* * *

Despatch Oven Loses President by Death

HERBERT L. Grapp, 52, president of **Despatch Oven Co.**, Minneapolis, died suddenly Mar. 22 while on a vacation in California. During the war, he served as manager of the company, and last year had been elected president. His father, A. E. Grapp, is founder and chairman of the board of Despatch Oven.

Firth Sterling Appoints Pittsburgh Manager

C. R. Harmon has been appointed Pittsburgh sales manager, **Firth Sterling Steel & Carbide Corp.**, McKeesport, Pa. He was formerly sales manager for Penn Carbide & Alloy Casting Co., and was previously associated with Jessop Steel Co., and Crucible Steel Co. of America.

Cowles Detergent Co. Appoints Fulton

THE Cowles Detergent Company, Cleveland, Ohio announces the appointment of **Harold F. Fulton**, better known as "HAD" Fulton, as Cowles Technical Man in the New York State territory to handle sales and service work for the Metal Cleaner Department.

* * *

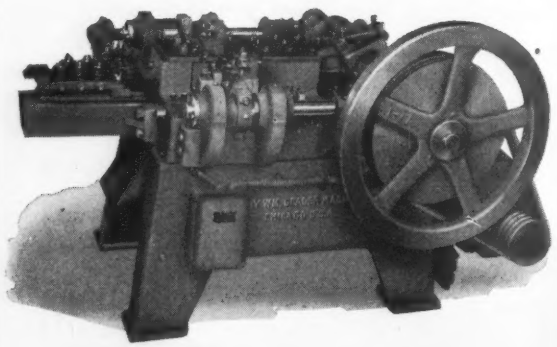
MR. Fulton is a graduate of Miami University. He has had a wide experience in the metal working industries and during the War was employed by Allegheny Ludlum Steel Corp. at its Dunkirk, New York plant.

* * *

HE is well qualified by education and plant experience to give valuable assistance to the industrial concerns in New York State.

* * *

GLADER HIGH SPEED WIRE NAIL MACHINE



MACHINE ARRANGED FOR INDIVIDUAL MOTOR DRIVE

High tonnage output, and low maintenance costs, have resulted in Glader Machines being accepted as standard equipment in every large nail mill built in the United States in the past twenty years.

Glader Machines are operating in most of the wire producing mills throughout the world.

These machines are made in eleven different types and sizes. This enables us to cover the range of sizes of nails produced with the greatest efficiency.

For further information please address,

WM. GLADER MACHINE WORKS

210 No. Racine Ave.
Chicago 7, Illinois

Export Dept.: 122 E. 42nd Street, New York 17, N. Y.

Lindberg and Fisher Merge

LINDBERG Engineering Company, Chicago, manufacturer of heat treating furnaces and electrical equipment, and **Fisher Furnace Company,** Chicago, manufacturer of non-ferrous melting furnaces, refractories, and blowers have recently united their organizations.

* * *

FIRST furnace development of the combined organization is the completely new Lindberg-Fisher induction melting furnace. Under the new arrangement the Fisher organization will be known as Fisher Furnace Division, Lindberg Engineering Company. **Mr. Kenneth D. Hoke,** former Vice President of Fisher Furnace Company will head this division. Fisher furnace manufacturing and office activities have been moved to the main Lindberg office and plant at 2444 W. Hubbard Street, Chicago. Refractories will continue to be manufactured at a second plant located at 5535 N. Wolcott, Chicago.

Portsmouth Steel Announces Appointments

HERBERT A. Snowden has been named general superintendent of the rod and wire department, **Portsmouth Steel Corp.,** Portsmouth, O. He was formerly associated with Seneca Wire & Mfg. Co., Fostoria, O., and prior to that was, for many years, assistant to the general superintendent of J. A. Roebling's Sons Co., Trenton, N. J. Other appointments include **Uno V. Johnson** as superintendent, **John E. Nordstrom** as chief metallurgist and **James F. Van Cleave** as superintendent of production. Before assuming his present position, Mr. Johnson had been superintendent of the wire mill of Wickwire-Spencer Steel Co., Buffalo. Mr. Nordstrom had been assistant chief metallurgist and Mr. Van Cleave assistant superintendent of production for Keystone Steel & Wire Co., Peoria, Ill.

D. K. MacLean Appointed Farrel-Birmingham Export Manager

FARREL-BIRMINGHAM Company, Inc. has appointed **D. K. MacLean** export manager for all lines of machinery manufactured by the company's four plants at Ansonia, Conn., and will continue as manager of the sugar mill machinery sales department.

* * *

MR. MacLean started in the Farrel engineering department in 1909, and his association with the company has been continuous for 37 years, except for a period of service in the U. S. Army during World War I.

* * *

DURING World War II, Mr. MacLean acted in a liaison capacity between Farrel-Birmingham and the War Production Board Rubber Division, and was a member of the WPB Industry Advisory Committee on sugar machinery and equipment.

WEAN EQUIPMENT Corporation

THE WEAN EQUIPMENT CORPORATION are recognized as specialists in high-efficiency strip and wire mill equipment.

COLD ROLLING MACHINERY

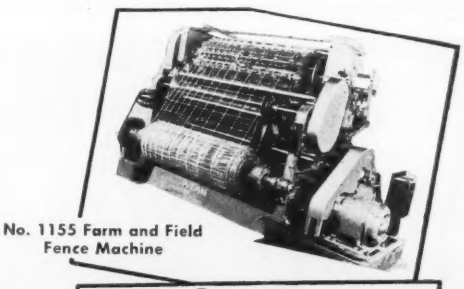
For 36" Wide Material and Narrower

MILLS · REELS · SLITTERS · LEVELERS
COILERS · EDGERS · SCALE BREAKERS · SHEARS
SCRAP BAILERS · CONTINUOUS PICKLING

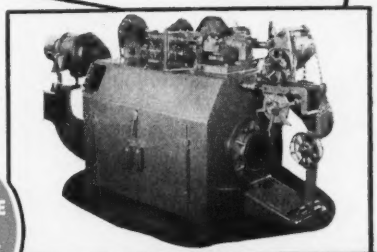
WIRE MILL EQUIPMENT

WIRE DRAWING MACHINES · PATENTING
GALVANIZING AND TINNING TAKE-UP FRAMES
WIRE FLATTENING · SPOOLERS
NAIL GALVANIZING AND BLUEING FIELD FENCE
and BARBED WIRE MACHINES

WEAN EQUIPMENT CORPORATION
22800 LAKELAND BLVD • CLEVELAND, OHIO

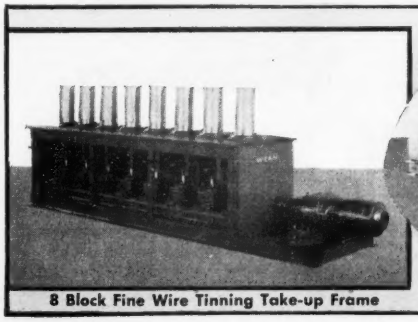


No. 1155 Farm and Field Fence Machine

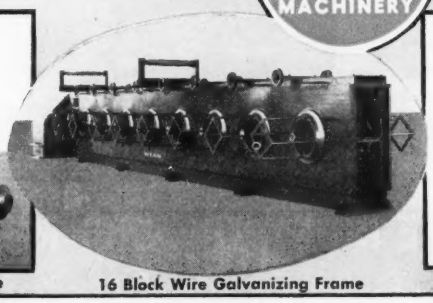


Barbed-Wire Fence Machine

HOLMQUIST BARBED WIRE and WIRE FENCE MACHINERY



8 Block Fine Wire Tinning Take-up Frame



16 Block Wire Galvanizing Frame

Strip Reel and Slitting Unit

Clough Reaches 25-year Mark with Belden

H. W. Clough, vice president of the **Belden Manufacturing Company,** Chicago, maker of electrical wire and cable products, and one of the most widely known men in the fields using these products, has rounded out 25 years with the organization.

* * *

CLOUGH, a graduate of the University of Chicago and veteran of World War I service with the meteorological section of the U. S. Army Signal Corps in France and England, joined Belden in April of 1922 as a member of the Magnet Wire Sales Service Department. He became a salesman in 1924; Canadian Sales Manager in 1927; Manager of the Merchandise Sales Division in 1928; Sales Manager in 1931; General Sales Manager in 1939, and was elected Vice President in 1940.

* * *

DURING his quarter century of activity, Clough estimates he traveled in excess of 1,000,000 miles by virtually every mode of transportation, including a sleigh on one of his Canadian winter tours, and visited hundreds of cities and towns in all of the states and nearly all provinces in Canada.

Titeflex Appoints Dr. Peters Chief Engineer

DR. Melville F. Peters, formerly in charge of research at Titeflex, Inc., Newark, N. J., has been appointed chief engineer. Before joining the Titeflex organization in 1943, Dr. Peters was a principal physicist at the Bureau of Standards in Washington, where he worked extensively on ignition systems for aircraft engines. In addition to his new duties as chief engineer, Dr. Peters will continue to direct basic research on Titeflex products.

* * *

Berger Appointed to New Post by Roebling

E. C. LOW, Vice President in Charge of Sales, announces the appointment of **J. F. Berger** to the position of Assistant Sales Manager, Woven Wire Fabrics Division.

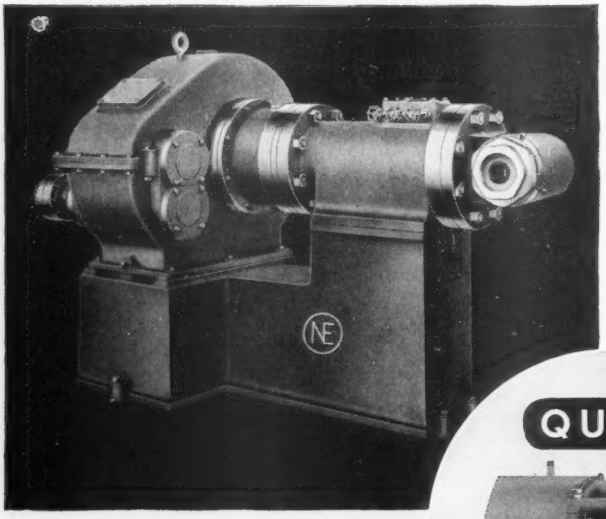
* * *

MR. Berger has been with the **John A. Roebling's Sons Company** for 37 years. He has had long experience with the company as a salesman and field engineer for the Woven Wire Fabric Division. He is well known by mining and quarrying men all over the country.

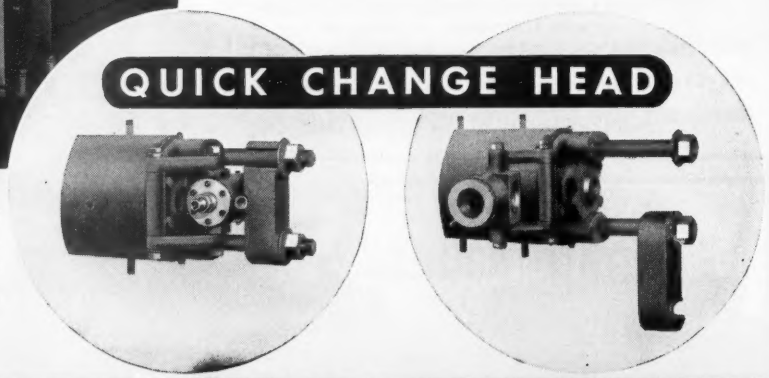
* * *

THE appointment of Mr. Berger is coincident with a program of expansion in both machinery and products for the Woven Wire Fabric Division. This expansion is part of Roebling's $6,000.000 investment in modernization and enlargement of production facilities.

* * *



NE TUBERS *adaptable to* **variety of products. Illustrated at left is a 4½" NE tuber equipped with cross-feed flanged-type head for insulating wire, extruding hose covering, special shapes or tubing. With slight modifications, either rubber or plastics can be handled.**



NE Quick Change Head Unit permits swinging Die Head out, for cleaning, inspection or changing. Just loosen 2 bolts. This feature illustrated on a 3½" NE Tuber is available on all sizes thru 6".

NATIONAL-ERIE CORPORATION
ERIE, PA. U. S. A.

Norton Company Appointments

COL. H. W. **Robbins** has retired as safety engineer of Norton Co., Worcester, Mass. He is succeeded by **John Hychka,** formerly of the company's plants engineering department. Mr. Robbins has been associated with the Norton Co. for 31 years.

* * *

Awards for Ideas Provide G.E. Employees with Substantial Payments

CASH awards totaling $114,100 were paid by the **General Electric Company** last year to employees whose ideas for improved plant and office operation were adopted under its 41-year-old Suggestion System, the company announced today.

* * *

A total of 8,782 suggestions by employees for improved production were adopted last year. Top award of the year was $3,000, highest ever presented, which was won by a war veteran who returned to his welding job at the G-E River Works at Lynn, Mass. The winner was **Richard E. Conley,** with a suggestion for an application of flame gouging. Second highest award was $2,030, presented **Richard Musgrove,** a transformer winder at the Pittsfield, Mass., G-E Works. Mr. Musgrove suggested a change in the method of making the connection between inner and outer secondary coils on certain types of distribution transformers.

* * *

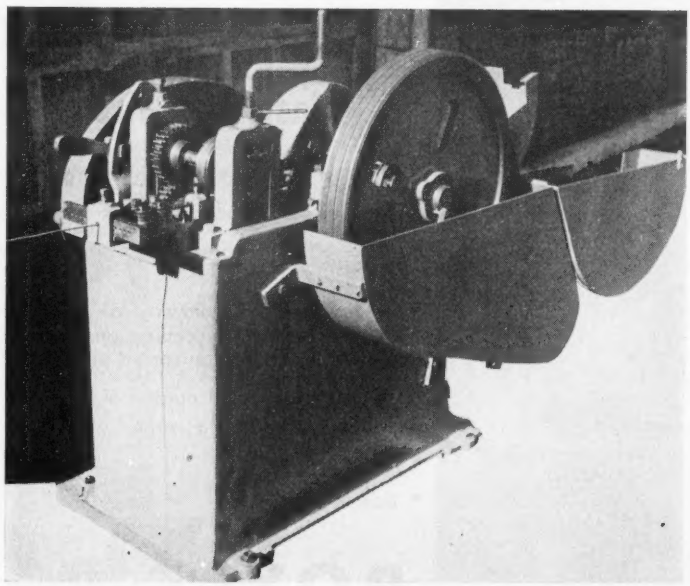
SINCE the plan was reorganized in 1922, approximately $2,110,000 has been paid by the company for employee suggestions, it was pointed out.

Roebling Gets Big Rope Job

JOHN A. **Roebling's Sons Co.,** Trenton, N. J., has completed plans for erection of a 10-mile long monocable aerial tramway paralleling the main ridge of the Andes mountains in Peru. The tramway was designed for Cerro de Pasco Copper Corp., in order to move ore to a railway terminus.

New England Representative for Apex Alkali Products Company of Philadelphia — B. H. Bean, Jr.

AFTER graduating from Sanford Prep School in Wilmington in June 1940 where he was captain of the football team and a 4-letter man. **Bud Bean** became associated with **Apex Alkali Products Company,** Main & Rector Sts., Philadelphia, Pa., in the production end of the business. He spent three years in the service, most of it in the European theatre, and then returned to his work, specializing in wire drawing lubricants and cleaning compounds. He will now represent Apex in New England with headquarters at New Haven, Conn.



HERE IT IS!

THE HUMPHREY RAPID FENCE STAPLE MACHINE

CUTS FENCE STAPLES 5/8" to 1 5/8", 900 TO 1000 PER MINUTE, UNIFORM IN SIZE, EVEN LEGS, CLEAN SHARP POINTS.

Also makes, with Attachments, Poultry Netting Staples and Double Pointed Tacks.

MANUFACTURED EXCLUSIVELY
for

REED and RICHARDS TRANSATLANTIC, INC.

CHANIN BLDG., 122 EAST 42nd ST., NEW YORK 17, N. Y., U.S.A.
REG. CABLE ADD.: "LOUREED, NEW YORK".

Wire Bale Tie Machines — *For export only: Double-Gear Windmills & Pump Jacks*

A Review of Recent Wire Patents

No. 2,418,192, STRAND WIRE STRUCTURE FOR APPARATUS TOWING, patented April 1, 1947 by Walter T. Peirce, Worcester, Mass., assignor to The American Steel and Wire Company of New Jersey, a corporation of New Jersey.

The cross section of the wire structure has one axis appreciable longer than the others so that its tendency to twist is resisted by the movement of the water relative to the non-circular shape of the wire structure.

* * *

No. 2,418,823, APPARATUS FOR MOLDING WIRE CORE TEMPLES, patented April 15, 1947 by Anthony J. Desimone, Lyndhurst, N. J., assignor to Columbia Protektosite Company, Inc., Carlstadt, N. J., a corporation of New Jersey.

A gang mold is provided having a number of temple-forming mold cavities with a common plastic-injection port, and piston tubes for holding the wire cores centered in the cavities and governing the flow of plastic material.

* * *

No. 2-419,017, METAL PROTECTIVE PIGMENT, patented April 15, 1947 by Godfrey Grimm, Nutley, N. J., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del., a corporation of Delaware.

This pigment comprises a mixture of ammonium ferrous phosphate in flake-like, crystalline form and zinc yellow, the ammonium ferrous phosphate component of the mixture ranging from about 5% to 30% by weight of the total pigmenting ingredients and the major portion of its iron content being in the ferrous state.

* * *

No. 2,419,095, ELECTRIC CABLE, patented April 15, 1947 by Donald R. Stevens, Ridgewood, N. J., assignor to The Okonite-Callander Cable Company, Incorporated, Paterson, N. J., a corporation of New Jersey.

The insulated wire conductor is covered with a sheath of plywood tape wrapped directly about the insulation.

* * *

No. 2,419,448, SCOURING APPARATUS, patented April 22, 1947 by Henry S. Gordon, Gary, Ind., assignor to Carnegie-Illinois Steel Corporation, a corporation of New Jersey.

For continuously scouring metallic strip, the inventor provides a device for pulling the strip through an abrasive tank, with a pair of conduits being disposed adjacent the pulling means, and a conduit on each side of the strip leading from that end of the tank opposite the first pair of conduits, there being means provided for delivering the abrasive from the second named conduits to the first named conduits.

* * *

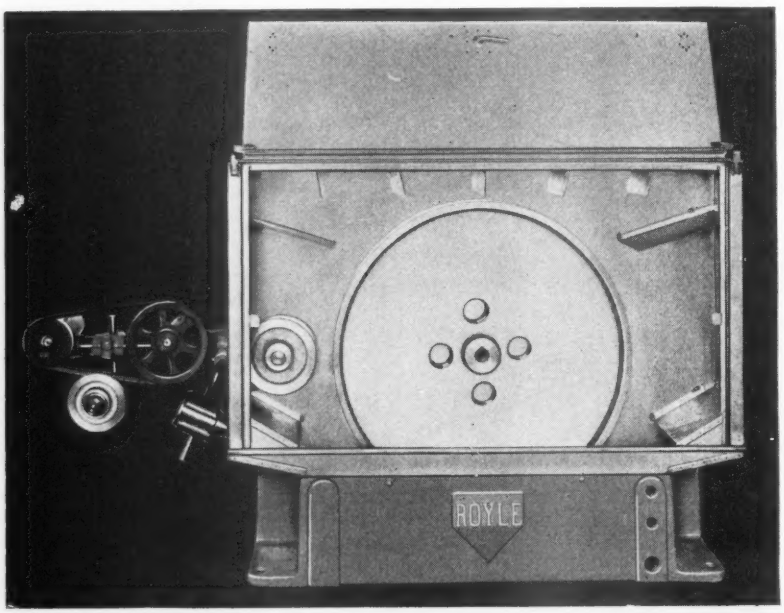
No. 2,419,555, SELF-THREADING AND LOCKING SCREW, patented April 20, 1947 by Charles D. Fator, San Antonio, Texas.

The thread of the screw comprises alined and joined threaded sections, one of these threaded sections having a constant pitch and decreasing in diameter from another threaded section toward the guiding portion, the first-mentioned threaded section being adapted to form a threaded path having helices of constant pitch in the plates through which it passes, and wherein the second-mentioned threaded section has a constant diameter and decreases in pitch toward the head and is adapted to form a subsequent threaded path between the helices of the prior path and also where the first-mentioned threaded section of constant pitch will have to reform its path in the plates to disengage the screw therefrom, thereby causing it to have an increasing friction fit with the pair of plates.

* * *

No. 2,419,591, MAGNETIC MINE-SWEEPING ELECTRODE CABLE, patented April 20 by Charles J. Quigley, United States Navy.

Complete Description and Drawings of Patents May Be Had for 50 cents, outside the United States and Canada $1.00. Address, Wire & Wire Products, 300 Main St., Stamford, Conn.



The Royle 36" High Speed Capstan for Resin Insulated Wire

- Stainless steel watertight enclosure
- Total enclosure permits higher wire speeds
- More efficient wire puller stabilizes wire speed
- Secondary idler pulleys guide wire across capstan preventing rubbing and permitting larger quantities to be cooled simultaneously
- All bearing located outside of enclosure to prevent contact with water
- Quiet running
- Built-in air wiper

JOHN ROYLE & SONS

ROYLE PATERSON N. J. 1880

PIONEERED THE CONTINUOUS EXTRUSION PROCESS IN

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James Day (Machinery) Ltd.
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Akron, Ohio
JEfferson 3264
J. C. Clinefelter

Los Angeles, Col.
H. M. Royal, Inc.
LOgan 3261

PATERSON 3, NEW JERSEY

This electrode comprises a number of layers of wires, the center of the electrode consisting of wires of cuprous materials covered with a conductive corrosion protective coating and the periphery of the electrode consisting of wire of ferrous materials.

* * *

No. 2,419,699 LOADING AND FEEDING APPARATUS FOR COILS OF STRIP METAL, patented April 29, 1947 by Frank J. Wood, Riverside, Ill., assignor to Goodman Manufacturing Company, Chicago, Ill., a corporation of Illinois.

A carriage support for the coil is provided, which support may be elevated in order to position the coil for loading onto an expansible mandrel, there being provided a device to align the edges of the turn of the coil while it is supported on the carriage.

* * *

No. 2,419,808, WIRE TENSIONING DEVICE FOR COIL WINDING MACHINES, patented April 29, 1947 by Otto Wirth, Zurich, Switzerland, assignor to Micafil Ltd., Zurich, Switzerland.

The device includes a biasing spring with means for maintaining the biasing effect of the spring, on a wire guide lever, constant regardless of any fluctuations in spring tension.

* * *

No. 2,419,825, COMPENSATING SPRING AND ALLOY FOR TIMEPIECES, patented April 29, 1947 by Samuel Dinerstein, Delavan, Wisc., assignor by mesne assignments, to George W. Borg Corporation, Chicago, Ill., a corporation of Delaware.

This alloy for hair springs having a constant modulus of elasticity over a temperature range of more than 100°F., with lower limit below 0°F., contains 30 to 40 per cent nickel, 5 to 10 per cent chromium, .2 to .3 per cent manganese, .2 to 1 per cent silicon, .2 to 1 per cent of a metal from the group of metals which includes tungsten and molybdenum, .04 to .06 per cent of carbon, and .2 to 1 per cent of a precipitation hardening agent such as beryllium, aluminum, zirconium and titanium, and the balance being iron.

Folder Describes Material Handling Truck

NEW literature has been issued by **Truck-Man, Inc.**, providing six pages of information on the Model D Truck-Man, gasoline-powered hydraulic lift truck. The folder contains complete specifications, dimensioned engineering drawings, construction detail close-up photos and description of Truck-Man's numerous unique features. Truck-Man's versatility is illustrated by a series of pictures taken in operation in widely diversified industries. Copies are available by writing **Truck-Man, Inc.**, Dept. AB, 1436 Ganson St., Jackson, Mich.

* * *

STEEL WIRE

by MAURICE BONZEL

* * *

Translated and Published by

Kenneth B. Lewis

Consulting Engineer

* * *

Price $15.00

* * *

495 pages—414 illustrations

* * *

SEND ORDERS TO

WIRE and WIRE PRODUCTS

300 Main St., Stamford, Conn.

Patented

2 BX Mossberg Carrier

MOSSPEED BRAIDER CARRIERS

Represent

Improved Braider at Lower Costs

The patented MOSSPEED spring tension take-up makes it possible to increase the speed of the maypole-type braiding machine. An effective increase of 80% being obtained in many cases.

The new (x) type MOSSPEED high speed carrier permits the rapid changing of tension springs making this an ideal carrier for braiding all kinds of yarn (cotton, rayon, asbestos, jute), in addition to fine strands of copper wire.

Consult our engineers regarding your braiding problems.

2 SE Copholder

Complete line of both MOSSPEED carriers and metal copholders for all sizes and makes of maypole type braiding machines.

MOSSBERG

Pressed Steel Corp.

Attleboro, Massachusetts, U. S. A.

18 West Street

James Day (Machinery), Ltd., "Ford House," 88 Regent Street, London, W. I., England.

Symposium on Testing of Bearings

THE American Society for Testing Materials held a Symposium on Testing of Bearings in order to make available latest information on the tests which are used, the equipment that has been developed and the correlation of laboratory tests with field service. The testing of bearings is one phase of a broad field covering testing of parts and assemblies in which A.S.T.M. has programs underway.

* * *

THE five technical papers comprising this symposium include one on life testing of plain bearings for automotive engines, by **E. T. Johnson,** Engineering Division, Chrysler Corp.; a discussion by **Thomas Barish** on fatigue testing machines for ball and roller bearings; and **A. B. Jones** of the Engineering Dept., General Motors Corp., has a very significant technical contribution on metallographic observation of ball bearing fatigue phenomena. Two other papers cover fatigue testing of roller bearings, by **H. R. Gibbons,** Hyatt Bearing Div., General Motor Corp.; and testing of bearings under controlled load, **J. M. Frankland** and **C. B. Innes,** Chance Vought Aircraft Division of United Aircraft Corp. There are several pages of discussion in the form of questions and answers which add to the value of the publication.

* * *

IN heavy paper cover, the 72-page illustrated publication can be obtained from A.S.T.M. Headquarters, 1916 Race St., Philadelphia 3, Pa., at $1.50 per copy.

New Standards Published

A minimum commercial standard for insect wire screening is now being distributed to hardware and building supply dealers, it was announced recently by **Ralph W. Bacon,** secretary of the **Insect Wire Screening Bureau.**

* * *

THREE mesh sizes — 16 x 16, 18 x 14 and 18 x 18 — may be labeled as standard under Commercial Standard CS138-47, which was voluntarily adopted by the industry and promulgated by the National Bureau of Standards.

* * *

OTHER mesh sizes, once regarded as furnishing adequate protection against flies and mosquitoes, notably 12 x 12 mesh and 14 x 14 mesh, were found unsatisfactory in tests made for the industry by independent laboratories, and are not included.

* * *

THE standard metals are galvanized steel, commercial bronze and copper. Thickness of wire used in weaving screening is specified as .011 inches.

An ADVERTISER likes to know his ads have been read so please mention WIRE & WIRE PRODUCTS when writing him.

UNION DIES — BETTER BUYS!

Satisfied UNION customers everywhere know the economy of UNION diamond dies but perhaps yours is one of the mills which has wanted to use UNION dies but hesitated at the higher initial cost. After all, it takes a long time to prove superiority in a diamond die and cost departments are impatient compilers of records.

However, now you can "GO UNION" at a new low price. UNION held its prices firm during the frenzied price-raising period of the past year, so that the new low price is not just a roll-back but represents a real reduction in die cost to you.

So "GO UNION" now in your diamond die requirements. You'll be glad you did!

DIAMOND POWDER **RECUTTING MACHINERY**

THE UNION WIRE DIE CORP.

24 Gore Street, Hamilton, Ontario
71 West 45th Street, New York City 19
375 Fairfield Ave., Stamford, Conn.
La Filiere Union, Paris, France

The Wood Screw Industry in India

IT may interest many of our readers to learn of the work of the **Indian Engineers' Corporation, Ltd.,** in Amristsar, India, a concern established as a partnership in 1943 and converted into a stock corporation in 1946. This company pioneered in the manufacture of wood and machine screws in India and today are also making tinman and engineering rivets, wire nails and panel pins.

* * *

DURING the war, when no machinery and equipment was available from abroad, this company was forced to manufacture their own machinery to make these prodcts.

* * *

THE Company has an authorized capital of RS 2,500,000, 6% cumulative preference shares of RS 100 each and RS 250,000 shares of common stock of RS 100 each. The office of the corporation is 014S Chatiwind Gate, Canal Bridge, P. O. Box 8, Amritsar. Mr. P. S. Kalsey is the Managing Director.

* * *

AS they have been granted protection by the Indian Government, they propose to erect a new and up-to-date addition for the manufacture of fasteners and to extend further their facilities for making production equipment.

* * *

Arista Applies for Patent on New Wire Compound

A patent on a new preparation for wire has been applied for by **Arista Oil Products Company,** 135 Front Street, New York 5, N. Y. The material, called "Aristol No. 40", is designed to eliminate the use of wet tubs in connection with the drawing of copper and liquor finished steel wire.

* * *

AFTER the wire has been copper or liquor finished, the excess acid is rinsed off and then the wire coils are immersed in a dilute solution of Aristol No. 40. They are then removed and allowed to air dry or are flash baked for a few minutes.

* * *

THE resultant wire is dry, protected against corrosion and has a good color when finished. The use of this particular method is said by the manufacturers to permit the liquor finished wire to stay around the plant for several weeks without danger of corrosion. It can subsequently be drawn from a dry reel, completely eliminating the use of wet tubs.

SEND IN

YOUR ORDER NOW

for the

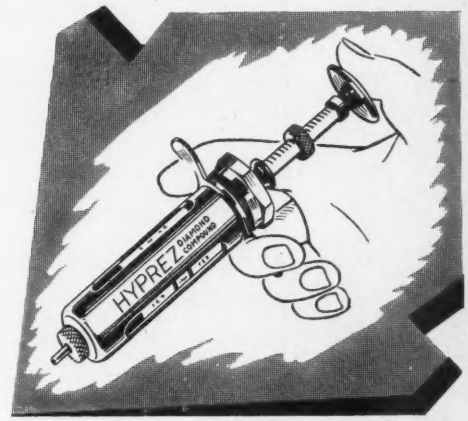
1947 WIRE BUYERS GUIDE

TUNGSTEN CARBIDE DIES

From Rough to Flawless Finish with

HYPREZ DIAMOND COMPOUNDS

Time Saving, Uniform Results



Wire drawing dies of Tungsten-Carbide can be finished complete from rough to lasting mirror polish with Hyprex Diamond Compounds — fast, uniformly, economically.

Accurately graded, fast-cutting diamond particles are permanently and uniformly suspended in the patented compound. All waste is prevented by metered applications from the Hyprez gun and by superior adherence of the compound to work and tool. Reliable repeat performance assured — no special equipment or experience required.

Unretouched photo at left shows HYPREZ-FINISHED tungsten carbide die. Customer's name on request.

A complete range of color-identified compounds for all finishing operations available in sealed cartridges for the Hyprez Applicator Gun.

HYPREZ DIVISION

ENGIS EQUIPMENT COMPANY

431 SOUTH DEARBORN STREET • CHICAGO 5, ILLINOIS, U. S. A.

New Diamond Powder Announced

THE **Magnus Chemical Company's Industrial Processing Division,** at Garwood, N. J., announces the development of a revolutionary new technique for the application of diamond grit to the full range of finishing operations where this polishing medium should be used. This new technique, which utilizes colored, pre-mixed diamond compounds available in tube or stick form, should materially expand the usefulness of diamond lapping. Colors are for identification.

* * *

THE efficiency and speed of this superfinishing technique has been demonstrated in a wide range of applications. The life of carbide or steel cutting tools can be increased 3 to 6 times longer. Any shaped molds and cavities for steel, plastic, glass, etc. are quickly mirror finished and kept in better shape. Plug gauges, punches and other cylindrical surfaces are quickly and simply superfinished. Production parts of any kind can be processed to any degree of finish. Rolls for all types of foil and sheet, from aluminum to silver to steel can be refinished while in place in the mill. Dies of all types and shapes are easily and quickly mirror finished.

* * *

PRECISION graded diamond grits are provided in scientifically proportioned compounds ready for instant use, which contain the proper percentage of diamond for each grade size. These compounds, supplied in eight particle sizes from approximately 120 microns, for extra coarse cutting, to approximately 1 micron, for super high micro finishing, are available in two forms. One is the stick form about the consistency of lipstick. The other is in paste form in a tube. Either type insures speedy and economical application. Each tube or stick is supplied with a case hardened steel roller for applying and spreading the compound.

* * *

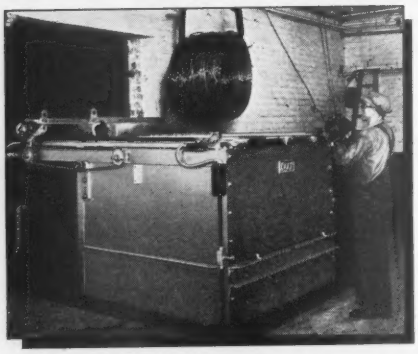
THE ultimate improvement which puts diamond lapping on completely precision basis is development which puts color work in thees operations. Insta identification of the right grit siz precise use of the proper compou in the most effective sequence a an end of mistakes and wastage insured by using distintive color to identify each grade. Not o the tubes and sticks but each gri size is identified by color in the compound itself. The eight grades of particle size are given eight individual colors. The rollers for each grade are also individually colored to match the grit and tube or stick for which it is supplied.

* * *

THE use of color puts all diamond lapping operations on a basis of easy duplication of precise microfinishing. The sequence of finishing stages can be exactly specified. For example, where severe grind marks are to be removed, the procedure is usually to rough down with black or red; jump to the brown or green in the next stage; the blue or orange in a third stage; and then a polish with yellow or white for high mirror finish.

SPEEDY, SCALE-FREE WIRE ANNEALING

★



Unique Ajax Electric Salt Bath Method provides fast, scale-free production—without decarburization. Cuts operating costs—greatly increases pot-life!

★

Added advantages in this modern, proved annealing method are—less floor space required, less labor, low maintenance cost, shorter time cycles (rarely over 20 minutes), no atmosphere equipment, no scaling, no explosion hazard. This modern electric salt bath annealing by the famous immersed electrode internal heating principle is ideal for annealing low carbon, high carbon and stainless steel wire and rod—in gauges from .020" to .250". Or for annealing aluminum, and copper and silver alloys. Also for descaling stainless and alloy steel wires in molten caustic soda. Recently developed salt mixtures greatly lower the cost of these operations. Interesting case-histories are available. Write for list of users.

AJAX ELECTRIC CO., INC.
FRANKFORD AND DELAWARE AVES., PHILADELPHIA 23, PA.
THE WORLD'S LARGEST MANUFACTURER OF ELECTRIC HEAT TREATING FURNACES EXCLUSIVELY!

THE **AJAX** HULTGREN ELECTRIC SALT BATH FURNACE

ASSOCIATE COMPANIES:
Ajax Metal Co.—Ajax Electric Furnace Corp.—Ajax Electrothermic Corp.—Ajax Engineering Corp.

IN other instances, where marks are not quite so severe to begin with, the initial stage may be started with the brown; jump to the blue; and finish with the yellow or white. Where repolishing alone is required, without the removal of grind marks or score marks, the green to orange or the blue to yellow, or orange to white will probably do.

* * *

THE Magnus diamond lapping kits are available in tube form in any desired combination of grit sizes.

* * *

COMPLETE information and descriptive bulletins of the Magnus Superfinishing Compounds in our own shop may be obtained by writing direct to the Industrial Processing Division, Dept. W. Magnus Chemical Co., Inc., Garwood, N. J.

Wire Handling with Industrial Trucks

(*Continued from page* 436)

the warehouse, operations of two battery-powered trucks are present augmented by some recently acquired gas-powered forktrucks, in the handling of palleted and skidded loads, carboys of acids and chemicals.

* * *

THE company is endeavoring to have all incoming supplies shipped on pallets, or in the case of wire coils, on new types of skids that have been devised for use in the special tiering racks. Such wire as is shipped in loose coils is palletized at car-door, moved into the warehouse area and there tiered five-high.

* * *

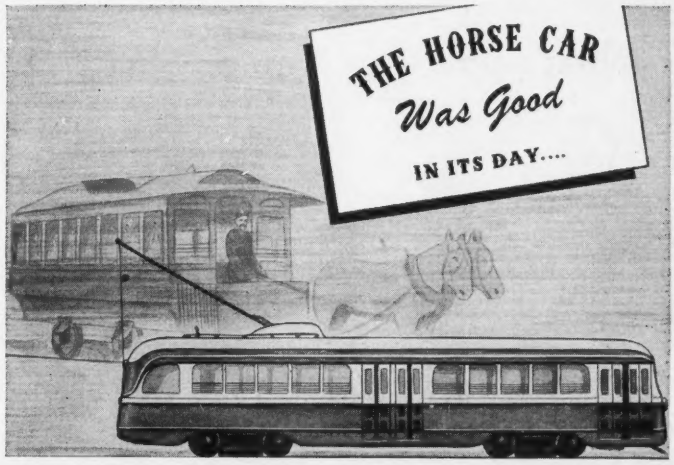
ORIGINALLY, the coils of wire were shipped in barrels by the vendors. Coils then weighed from 55 to 70 pounds. These barrels were strapped to pallets. When de-palletized the barrels were placed on special platforms, weighed and then tiered on the special steel racks. Loads could be placed as far back as fifteen feet from the entry of these racks, and an enormous amount of material thus could be storaged on a comparatively small floor area, and to the extreme of our vertical storage area.

* * *

IT was found that the smaller coils were uneconomical to handle in production operations since, being in comparatively short lengths, there was considerable unproductive time recorded at the machines, this being taken up by the 'threading' of the machines. There also was a large amount of waste. Therefore shipment of wire in coils weighing up to 240 pounds was requested. When it was found that this weight was too great to be accommodated in barrels, the coils were shipped on pallets. By means of trucks we could handle these palletized loads quite easily."

* * *

IN this connection the unloading and warehousing of a 30,000-pound car of palletized coils now is done by one man and a truck in from one-and-a-half to two hours, whereas unloading a similar car of unpalletized coils, and palletizing



It would only draw crowds of jeering spectators, if it appeared on the streets today. Science has progressed along every front, since the day of the horse-cars -- and so it is with pickling procedure.

BUT...

Rodine*

added to the bath, insures a well-controlled pickling cycle for both sulfuric and muriatic acids.

Rodine prevents acid attack on good metal; and it prolongs the life of the bath, through the prevention of acid waste.

With Rodine, over-pickling and acid embrittlement are held to a minimum.

Rodine holds down fumes -- makes pleasanter working conditions -- safequards health and comfort.

For better control -- savings in metal and acid -- economical scale removal -- smoother surfaces -- improved pickling all around -- add Rodine to the pickling bath.

* Trade Mark Reg. U. S. Pat. Off.

CHEMICALS ACP PROCESSES

RUST PROOFING AND PAINT BONDING
Granodine *
Duridine *
Alodine *
Lithoform *
Thermoil-Granodine *

RUST REMOVING AND PREVENTING
Deoxidine *
Peroline *

PICKLING ACID INHIBITORS
Rodine *

AMERICAN CHEMICAL PAINT CO.
AMBLER ACP PENNA.

the coils at car-door, took some twelve man-hours, exclusive of the man-hours used to move and tier the pallets in the warehouse.

* * *

IT is planned to handle raw material and semi-finished, or finished product, as much as possible on pallets. Suppliers also are being requested to ship on pallets, except in the case of wire suppliers who are to be supplied with the new type of special pallet. This accommodates the coils in a vertical position, the coils being strapped to the pallet.

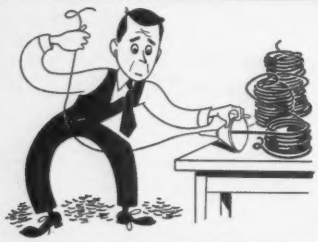
* * *

ALL inter-plant movement of material will be by pallet, in loads ranging up to one ton in weight. A system of supplying all plants — the three located in Meadville, Pa., one in Erie, Pa., and a recently acquired plant at Hamden, Connecticut, which is being converted to manufacture of the Talon slide fasteners — with semi-finished, or completed component parts in palletized unit load shipments, is in course of development at present.

* * *

A system of preventive maintenance, with greasing, inspection and check-up of the trucks once a week, and a method of rotating batteries in service — there is a spare battery for each truck — has done considerable towards keeping maintenance and unkeep costs extremely low, while the availability of the trucks is "extremely high." Some of the trucks operate a full three shifts a day, five days a week, while the lightest, the 1,875-pound capacity, fork-lift truck, is operated about a shift and a half a day.

What's your Fine Wire problem?



Problem 1

Mr. Big had scads of wire, but it was all too large for his use He sent it to Fine Wire Headquarters. We put the wire through our machines and drew it to his specifications. We can do the same for you if you have or can obtain wire that does not meet your present requirements.

Problem 2

Mr. Round had to have some flat wire. So we put his wire stock through our rolling equipment after drawing it to proper size. Out came flat wire to his specification.

Problem 3

Mr. Silver had some wire that he wanted to plate. He sent it to Fine Wire Headquarters. We plated it and the wire came out with a uniformly dense coat of high lustre.

the answer

YES sir, the answer to all your fine wire problems is right here at Fine Wire Headquarters. You will never know how many ways we can help you until you ask. So — when you have a fine wire problem — wire to be redrawn, flattened, plated or what have you — wire or write to North American Philips, makers of ELMET Tungsten and Molybdenum and NORELCO fine wires.

NORTH AMERICAN PHILIPS COMPANY, INC.

Dept. W-6, 100 East 42nd St., New York 17, N. Y.

Yards Per Minute Meter

NOW available are hand Type 25D linear speed meters for measuring speed of travel. Designed for rugged use and sustained accuracy they are especially useful in the paper, steel and textile industries for checking the speed of the product through processing mills and presses. Usually supplied as single range instruments, they provide an accuracy of 1% and are available in a wide selection of ranges from 3 to 3,000 yards per minute or 10 to 10,000 feet per minute. All meters are direct reading and are calibrated in either feet or yards per minute.

* * *

CONTACT to the moving member is made with a replaceable free running disc 1 foot in circumference (3-7/8" in diameter) which is solidly clamped on the rotating shaft of the head. The contact surface of the disc is oil resistant synthetic rubber which has a high coefficient of friction and good wear properties. Lubrication of the head is permanent for long life and the instrument is rugged electric type with no flexible shafts, centrifugal mechanism or other components to wear out. For further information, write to **Metron Instrument Co.**, 432 Lincoln Street, Denver, 9, Colo.

SEND IN YOUR ORDER NOW for the 1947 WIRE BUYERS GUIDE

Wire Association Elects Officers

(*Continued from page 438*)

wasn't dumb he would be working for himself, not for me. I see the labor union as an evil in itself. I deny that they have accomplished anything desirable; where socially desirable results have followed their efforts the relationship has been quite accidental, not cause and effect. I do not believe that labor unions and free enterprise can co-exist.

Now for the complaint. Those charts that show the small segment labelled wages and the big one labelled materials are not the sole product of the labor economist. (Pardon my use of that word without quotes). Some of the corporations who send me stuffing for my waste-basket show similar charts. They are mischievous and misleading; in the hands of these undeveloped children who man our plants they are as bad as matches. I should like to see publicity given the truth that each plant's raw material is the finished product of another plant or enterprise and in such plant it can be further broken down into labor and material, and that this process goes on and on until the elements of the product are chased back to the mine, the quarry, the plantation, or the like, from which they are extracted by labor. There you may sometines find the first trace of an element of cost not direct labor, namely a bit of ground rent or royalty; even this microscopic percent of the total could be shown to be deferred payment for labor performed without compensation in the past.

* * *

The logical conclusion that can be drawn from this view, and made clear to the most stupid, is that when a raise is granted it increases not merely the small segment labelled wages, but the segment called (erroneously) materials as well, and that such increases in wages cannot be squeezed out of the owners of raw materials, who are non-existent, but are gained by the organized at the sole expense of the unorganized workers. Let the unorganized workers once understand that, and unionism would start to wither. It can be made clear to them that when and if the whole mass of employed labor is in the union, there is no more blood to suck.

* * *

I have another complaint. Labor orators and the cloth-headed clergy, professional group, press, and the rest, are constantly reiterating that profits of industry have been enormous in reecnt times. Nobody denies it; that is, nobody but me, in my hearing. Representatives of capital seem simply to cower at the charge. Is it true? If so, where the hell is my share, and how am I being gypped? I own a part of about twenty large representative undertakings, steel, chemical,s paper, tobacco, food, motors, machine tools, and the like. I can't average 5% out of the investment. Where is my money going? If these profits are being made and I am being by-passed, I am going to raise the devil with somebody. If on the other hand those profits are non-existent, what the hell is the N. A. M. and the managers of my companies doing? If they are issuing any denials they sound like the last gasp of an old sheep dying of hunger in the bottom of a dry well.

* * *

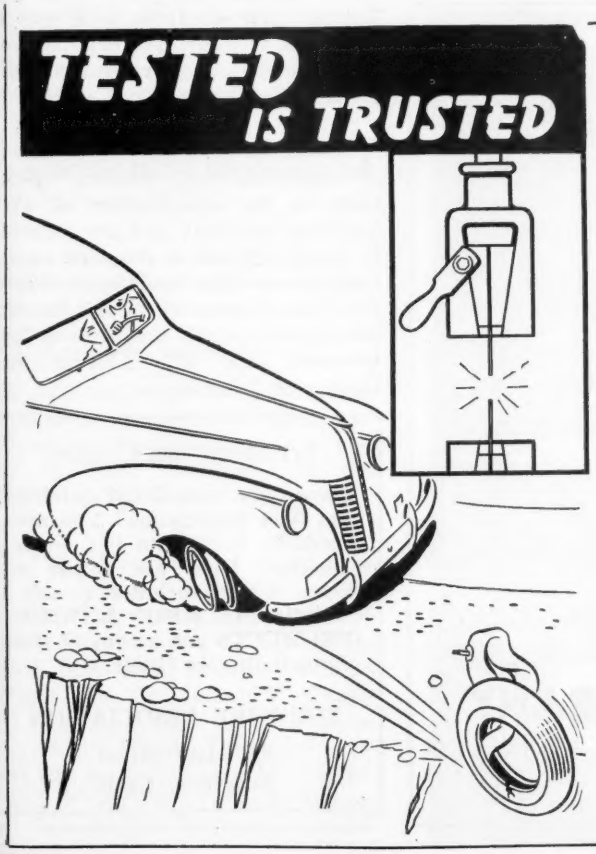
Another peeve had better be aired while I am still foaming at the mouth. I refer to the practice of reporting earnings as so many million dollars, without explaining that this sum is a certain small percentage of the investment, or represents a certain percent of the dollar of receipts. And another. Why report "profit before taxes." It is a contradiction in terms. Taxes are an item of cost. You might as well say profits before costs. It is just another handle for the bomb-throwers to grab.

* * *

I realize that the manager is at a disadvantage. The labor leader reaches his place as a result of natural selection; he is the man best fitted to make on the minds (that's a joke, son), of his hearers the impression he must make to hold his job. The manager of industry reaches the top through the same chanels but with the reverse English. He is the man who can look past words and judge deeds. If he were able to talk as effectively as the labor boss, and could bring himself to do so, he wouldn't have time to manage. Still, I am constantly being amazed at the way in which management continues to hand the labor boys these bombs with lighted fuses, and then when the bomb goes off they say, dear dear, I didn't mean for you to do that.

* * *

Well, you see what I mean, I hope. It sickens me to see executives weaken and toady to these apes, to quit fighting, to assume that the thing is here and the best we can hope for in the future is to alleviate its horrors so far as we can. I am constantly on the boil. I used to be asked to speak on the subject a few years ago;



HOW 'GOOD' was the BEAD?

*Scott Tester Model J-5 is universally used for testing tire wires for elongation and tensile strength. Capacities up to 1,000 lbs. World-standard tests; "picturized" graph results.

"Adequate Testing Always Pays"

SCOTT TESTERS

*Registered Trade Mark

SCOTT TESTERS, INC.

55 Blackstone Street ● Providence, R. I.

DORE "WIRO-MATIC"

STRAIGHTENING and CUT-OFF MACHINE

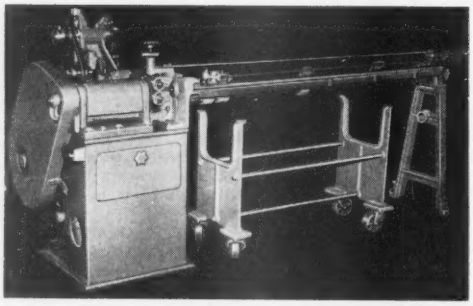
MODEL A, Illustrated,

handles 1/16" to 5/32" wire. Cuts uniform lengths at high speed within tolerances of plus or minus .005".

RANGE OF SPEEDS

Lengths	Pieces per hour
6"	15,996
144"	976

Above speeds possible on wire of #9 to #16 gauge.



Wire trucks or baskets are supplied as optional equipment, if desired. Also furnish wire reel pay-off tilt stands, adjustable or non-adjustable.

For full particulars and prices, write to

DORE MANUFACTURING COMPANY, Inc.

MANUFACTURERS OF MACHINES FOR THE WIRE INDUSTRY

GRAYLING, MICHIGAN

STANDARD & SPECIAL

TUNGSTEN — CARBIDE DIES

COLD HEADING and EXTRUSION DIES

Wire Drawing Dies — Tubing Dies — Coating Dies — Sizing Dies —Ring Gauges — Cut-off Quills. Also Manufacturers of Diamond Dies & Diamond Powder.

For Immediate Delivery on Standard Boltmaker & Extrusion Dies, Wire Drawing & Tubing Dies, Address Inquiries to: —

MICHIGAN WIRE DIE COMPANY

11152 CHALMERS AVE. DETROIT 5, MICHIGAN

Phone: Pingree 5702

now I am regarded as too radical. But I shall go on yapping about it till they nail me down, and then, by God, they had better sound-proof the coffin lid if they want a quiet graveyard."

* * *

THIS of course represents the extreme in view-point of an investor but it gives an indication of the way most people are thinking at the present time.

New Small Welding Timer

WELDING and industrial timers especially designed for the equipment manufacturer are exceptionally small and permit highly versatile application. The control box which is only 4 x 4 x 2 inches can be mounted with bracket or incorporated in the machine by flush mounting in any panel surface near the operator with the timer box mounted anywhere out of the way. Or, the control box can be screwed to the timer box for mounting as an integral unit. The timer is of the well proven electronic type with no mechanical components to wear out. One tube and 2 relays are employed and conservatively used for long life. Timing intervals from 1/60 second up to several minutes can be provided in one or several continuously variable ranges.

* * *

THESE timers are useful for both spot and butt welding operations in the manufacture of wire and wire products and are currently being supplied as standard equipment on welders made by the Micro Products Company. For detailed information, write the **Metron Instrument Co.**, 432 Lincoln St., Denver 9, Colorado.

TO WIRE MILL MEN

Have you considered joining the Wire Association? You are cordially invited to become a member. Dues are $15.00 a year, which includes a subscription to WIRE & WIRE PRODUCTS and a copy of the Annual Buyers Guide.

THE WIRE ASSOCIATION

300 Main Street, Stamford, Conn.

Micro Ball Bearings

A new line of precision solid-race ball bearings in radial and pivot designs is now being produced in quantity in both English and Metric dimensions from 5/32″ to 3/8″ outside diameter.

* * *

FOR compact mechanisms or instruments, where accuracy, low friction, high capacity and long life are important, these MICRO-bearings offer high performance at moderate cost.

* * *

FULL-RACE radial bearings of 1/4″ to 3/8″ outside diameter in inch sizes, and pivot (angular ball-contact) bearings from 5/32″ to 3/8″ O.D. are offered. The pivot bearings will tolerate substantial misalignment of shafts and are fitted with dust cap. All bearing rings and cups are machined from solid bar alloy steel, heat-treated to optimum properties, micro-finished on running surfaces and ground on the exterior. Special non-corrosive or non-magnetic materials are also available. Normal tolerance for all sizes and types is ABEC 1, as in Standard precision bearings. For finer requirements, the radial bearings are also available to ABEC 5 (-series). For additional information, write to **New Hampshire Ball Bearings, Inc.** Peterborough, N. H.

Worcester Regional Meeting of the Wire Association

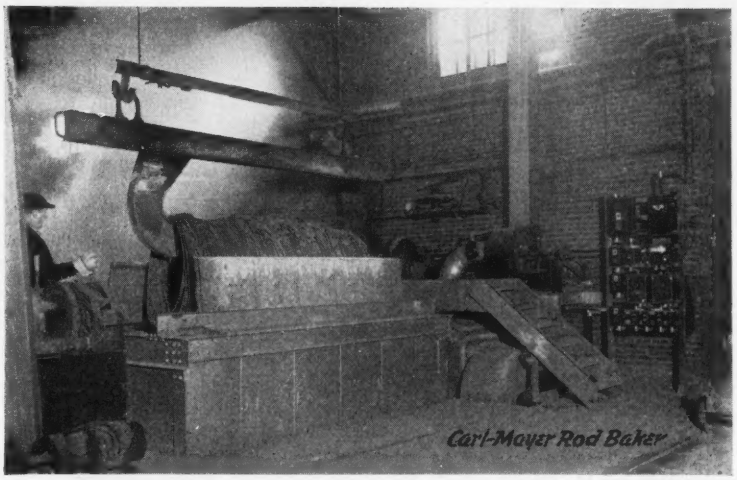
(*Continued from page* 439)

one mill and wove it in the other. Eventually he installed wire machinery at the Worcester plant, and put in rope machinery at the Palmer mill.

* * *

IN 1919 there was a merger of three plants, **Wright Wire Co.**, **Clinton Wire Cloth Co.**, and **Morgan Spring Co.**, with its subsidiary **National Mfg. Co.**, into the **Clinton Wright Wire Co. George F. Wright** had long since died, and the chairman of the board of the new concern was his son George M. Wright. Within a year the new consolidation had become the **Wickwire-Spencer**

MORE PRODUCTION *with* CARL-MAYER HI-SPEED ROD BAKERS - OVENS - FURNACES



Patented
TYPICAL HI-SPEED ROD BAKER — DIRECT OR INDIRECT HEAT — ANY FUEL
WRITE for BULLETIN No. 241

Growing interest in our type of equipment is evidenced by Carl-Mayer installations for such plants as:—

American Steel & Wire Co.
Atlantic Wire Co.
Atlas Steel Co.
Atlas Tack Corp.
California Wire Cloth Corp.
Eaton Mfg. Co.
Frost Steel & Wire Co. Ltd.
Hollup Corp.
Johnson & Nephew Ltd.
Jones & Laughlin Steel Corp.
Pittsburgh Tool Steel Wire Co.
Republic Steel Corp.
Steel Co. of Canada
Wickwire Spencer Steel Div.
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THE CARL-MAYER CORPORATION
3030 EUCLID AVENUE
CLEVELAND, OHIO

Johnson Steel Spring Wire (XLO Music Wire) is available in a wide range of sizes from .003″ (38,206 ft. to the lb.) up to .200″ (9 ft. to the lb.). Produced with micrometer precision, this wire of a thousand uses — springs, wire forms, appliances. — This quality product is available from Johnson sales offices.

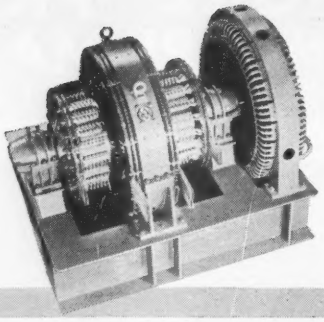
JOHNSON
STEEL AND WIRE COMPANY, INC.
WORCESTER 1, MASS.
NEW YORK AKRON DETROIT CHICAGO LOS ANGELES TORONTO

H-VW-M

GENERATORS

FEATURING

Versatility



FEATURES built into H-VW-M generators qualify them for many types of service, appeal alike to electroplaters, anodizers, electrotypers, producers of electrolytic chemicals, metal refiners. Among these features are:

Core-ventilated laminated armatures of non-aging silicon steel • Low-loss laminated fields • Generous sleeve-type bearings with oil-rings — for long, quiet operation, easy maintenance • Wide voltage range or stable voltage characteristics, as needs require.

A 6-volt, 15,000 ampere H-VW-M Motor Generator Set is shown above.

H-VW-M generators are built in standard voltage ratings of 6, 9, 12, 15, 18, 25, 30, 40, 50; in ratings up to 25,000 amperes.

Write for H-VW-M Generator Bulletin

HANSON-VAN WINKLE-MUNNING COMPANY

MATAWAN, NEW JERSEY

Manufacturers of a complete line of electroplating and polishing equipment and supplies

Plants: Matawan, New Jersey • Anderson, Indiana

Sales Offices: Anderson • Chicago • Cleveland • Dayton • Detroit
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SINCE 1820

NEW — AND BETTER

The *Trauwood* PROCESS

PATENTING
TEMPERING
ANNEALING

OUTSTANDING ADVANTAGES

Higher and more uniform physical and fatigue properties.

No surface decarburization or scale.

Faster wire speeds . . . greater production.

Equipment fully automatic and easy to operate.

Control of heating and cooling cycles extremely accurate.

Thermal efficiency of the process very high.

Much finer grained structure possible.

High quenching temperatures rapidly attained.

Adaptable to high alloy and austenitic steel wire and strip (annealing of stainless).

The Trauwood Process, new in principle, eliminates high temperature furnaces and lead pots with their excessive maintenance costs and low thermal efficiencies. More positive temperature control is possible and quenching is done in a RISING temperature—instead of falling, as in conventional heat treating methods. The rapid rate of heating (4 to 5 times as fast as furnace heating) increases production and uniformly produces a finer grained product with higher physical and fatigue values.

Wire and rod patented by the Trauwood Process insures easier drafting and makes heavier reductions possible. In conjunction with the Trauwood patenting equipment, pickling, coating and baking can be made continuous, eliminating expensive handling and delay, materially reducing costs as compared with ordinary methods.

Complete details of the Trauwood Process will be furnished you on request. Our engineers will help you solve your continuous wire and strip patenting, tempering, and annealing problems. Write today.

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203 WESTERN RESERVE BLDG., CLEVELAND, OHIO.
British Representative:
JOHN RIGBY & SONS, LTD., LOW MOOR, BRADFORD — YORKS. ENGLAND

Steel Corp., of whose early days many of us are acutely familiar.

* * *

THE early struggles of the new corporation were more violent than is usual in such cases; they might properly be referred to as convulsions. Old jealousies flared up, internal politics was violent, and after each tremor the bodies of executives, major and minor, strewed the landscape. The vice president of the new concern was **George F. Wright,** grandson of the founder of **Wright Wire Co.** and after one comparatively mild shake, he gathered up his personal papers and took that long walk down the front steps. The fact that his father was chairman was of no consequence; vice presidents were a dime a dozen.

* * *

GEORGE looked around a few days, and then teamed up with Albert Knapp, a brilliant but sound loom expert, and five months later there was the **G. F. Wright Steel & Wire Co.** shipping wire fabrics from its plant in the buildings formerly occupied by the Worcester Plunger Elevator Co., on Stafford St. Successful from the start, the company soon built itself a wire mill, then expanded its operations, and, in a word, has never looked back.

* * *

THE **New England High Carbon Wire Co.** and **Thompson Wire Co.** were mentioned, but there was no time to go into their interesting histories, nor even to mention **Spencer Wire Co.**, the oldest mill in the country. Old-timers from all these plants sat at the head table, confirmed or corrected the speaker when called upon, and promised their corporation in recording the origins.

ADVERTISING is a service to a magazine's readers. Methods, materials, and machinery were developed under the stress of war. Both editorial matter and advertisements keep you informed on what is happening in industry.

Controlled Production with

PRODUCTIMETERS

Throughout various wire processing, Productimeters give exact measurements in feet or yards . . . provide records for time study and control. They're ruggedly built, precision designed to meet heavy production demands.

You'll find the Productimeter line of wire measuring units complete, offering many models of varying speeds and capacities for your selection.

Model 5-SD-7-3 End Drive Rotary Productimeter installed on Wardwell 16-carrier Braider

Note flexible coupling connection to capstan. Registering directly in feet, the unit furnishes records for establishing fixed costs per foot of braiding.

Ask for Catalog No. 40

DURANT MANUFACTURING COMPANY

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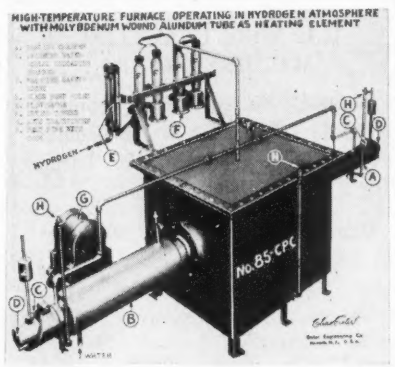
PRODUCTIMETERS
THE SPEEDOMETERS OF INDUSTRY

High Temperature Furnace for Annealing and Degasifying Rare Metals Operating in an Atmosphere of Hydrogen

THE accompanying illustration shows the latest model of a Hydrogen Electric Furnace, manufactured and marketed by the **Eisler Engineering Co., Inc.**, Newark 3, New Jersey. The inside of the steel-fabricated, hermetically sealed furnace is fire-brick insulated and the heating element operating in an atmosphere of constant flow of Hydrogen consists of a molybdenum wound Alundum Tube, capable of withstanding temperatures as high as 3000°F. The furnace is supplied with a tubular loading chamber, and on the opposite side of it, with a jacketed water cooling unloading chamber. Both chambers are equipped with weighted safety-doors and glass peep holes on its ends. Attached by brackets to the furnace is further the Flow Gauge, connected with four drying towers, for controlling


HIGH-TEMPERATURE FURNACE OPERATING IN HYDROGEN ATMOSPHERE WITH MOLYBDENUM WOUND ALUNDUM TUBE AS HEATING ELEMENT
HYDROGEN
No. 85-CPC

High Temperature Furnace for Annealing Wire.

and regulating the hydrogen gas flow, set about 5 pounds per sq. in. by the reducing valve on the tank. The drying towers are charged usually with some chemical absorbent such as calcium chloride, sodium lime, activated alumina or other substances particularly well adapted to desiccate the entering commercial hydrogen gas, that is to rid it especially of moisture.

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THE furnace is provided with the necessary piping and supplied

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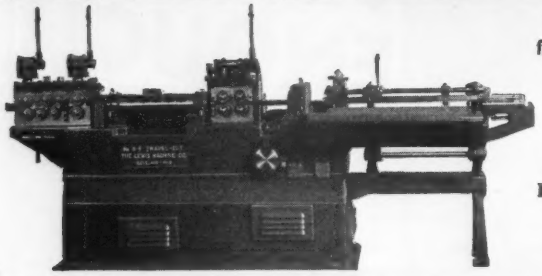

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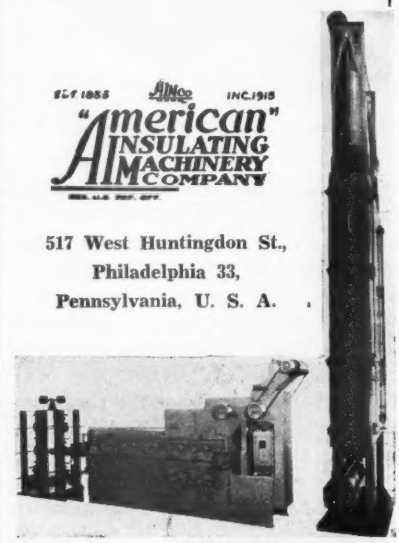

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with a proper auto transformer for heat regulation, either standard type with eleven point tap switch or special type with about eighty steps.

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THE oven and the chambers are each supplied with a small test pipe with outlet cock. A hydrogen flame ignited at the test pipe of the loading tube is kept permanently burning while the furnace is in action. Calm burning of this flame without puffing, indicates that the furnace is completely filled with hydrogen gas.

* * *

THE important function of this furnace is to degasify the metallic material before being used in the manufacture of incandescent lamps, radio and electronic tubes, and to deprive it radically from all contaminating substances especially oxides and moisture. Reliable service and long life of lamps and tubes depend mostly on the effectiveness of this vital deoxidation and drying procedure.

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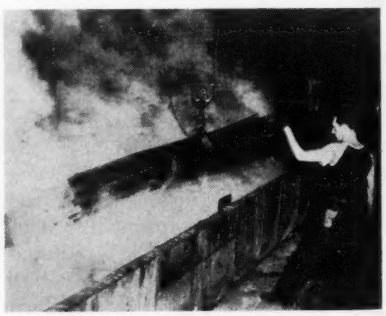
A new type pickling sling has been developed especially for the handling of thin wall tubing



Pickling Sling * * * * *

in the pickling bath. A product of the **Cambridge Wire Cloth Company,** Cambridge, Md., it is patented under the trade name, "Duplex", and can be used for rod and bar stock as well as tubing.

* * *

THE sling is of mesh construction with flat, even surfaces that do not protrude to collapse the tubing or scratch the finish. It

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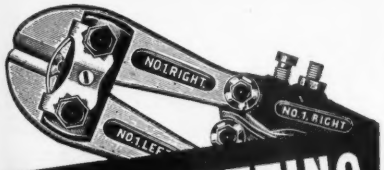

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can be placed around the tubing and hooked into a hoist in one operation. The sling is made in any desired length or width of Monel, Inconel, or other materials to resist the corrosive action of the pickling solution. The Monel sling illustrated will handle 5 tons of stock for pickling.

Ajax Electric Company Issues Book on Salt Bath Heat Treatment

A handsomely bound, 72-page booklet that thoroughly covers the subject of electric salt bath heat treating and processing has just been published by **Ajax Electric Company,** Incorporated, Philadelphia 23, Pennsylvania, manufacturer of Ajax-Hultgren Electric Salt Bath Furnaces.

* * *

CONTAINING more than one hundred illustrations, the booklet first discusses the general advantages of salt bath heat treating and follows this with an explanation of the unique, electrodynamic self-circulating principle of the Ajax-Hultgren furnace and the additional advantages resulting from it. A 16-page section consisting largely of installation photos illustrates and describes the wide variety of mechanisms which the company has developed for conveying work through a complete series of heat treating operations on a mass-production basis.

* * *

OTHER sections are devoted to the following salt bath heat treating operations and processes: Neutral Hardening, Isothermal Processing (Austempering and Martempering), Liquid Carburizing, Cyanide Hardening, Hardening and Nitriding High Speed Steel, Heat Treating Aluminum, Annealing, Descaling and Cleaning, Dip Brazing, Heating for Forging, and Tempering and Coloring.

* * *

BECAUSE of its costliness and limited edition, this booklet is available only to metallurgists and metalworking executives whose requests are sent directly to the company on their firms' letterheads. Specify Booklet No. 116.

* * *

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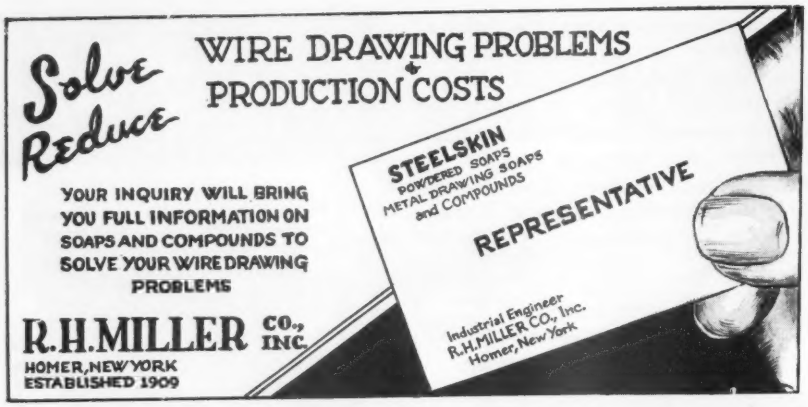

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NON-FERROUS **WIRE** FERROUS

COILING SPOOLING **SPECIALISTS** STRANDING BRAIDING

Ask for Catalog

Servicing of Dies

(*Continued from page* 433)

are getting even greater profits by maintaining proper conditions in their mills, from practically perfect lubrication systems to the daily check, and removal of both back dies and finishing dies that show wear. Some factories keep records of the time run for different alloys so they know where to look for wearing, and they replace the die before it develops a major flaw. Quite a few of the mills have expert repair department heads who realize that quality rather than quantity recuts save money—their mill foremen cooperate by daily checks on all dies and the stock department is able to rematch the set not only because of a sufficient stock of new dies but because their reconditioned dies are as good as new."

* * *

"THAT does give a brighter picture, Son — and you've done a good job, you know — there may be some factory managers whom you didn't visit who are having trouble without knowing what causes it."

* * *

"YOU have put your finger right on a point that relatively few people seem to appreciate. Some do not seem to realize that diamonds are not man-made, but a natural product in which one stone is so different in quality and shape from the other.

* * *

"WELL, my boy, we all know that, and of course every one who handles a diamond tool must make allowances for those differences."

* * *

"EXACTLY, Boss, but they have to know that no matter how well the man who made the die has done his job, or how good the man who uses or repairs the die might be, the results are bound to differ according to the nature of the stone.

* * *

"OF course, you told them all that."

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Back of every foot of this wire is over 70 years of wire-making experience. There's a size and style for every purpose.

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CORTLAND, N. Y.

Cortland BRANDS

"NATURALLY, and I also told them that although absolute uniformity may be impossible, for best production with economy, only the best quality of die stones available should be used by their die manufacturers, even if the mill has to pay the necessary cost."

* * *

"YOU know, young man, I think we are getting somewhere on these problems and just to make sure, I'll have the notes on this conference transcribed and pass your experience along the line. . . .Miss Smith! . . ."

New Type Cast Iron Electrode

"NICAST" is a new electrode reported by the manufacturer to put cast iron in a class with steel for ease of welding and finishing.

* * *

FOR maximum usefulness, it was made to operate on either AC or DC current. Welds produced are strong, non-porous and machinable in both the weld and fusion zone areas. This machinability makes it possible to drill, tap, mill or machine weld deposits in any manner, shape or form.

* * *

THIS new electrode is good for repairing broken castings, building up worn castings, correcting machining errors and welding cast iron to steel.

* * *

MOST applications require no preheating or post-heating. It is an all-position electrode and can be used in flat, vertical, overhead or horizontal work. They are furnished in either 1/3" or 5/32" x 14" sizes. Further information can be had by writing Harnischfeger Corporation, Welding Division, Milwaukee 14, Wisconsin.

Wickwire Bros. at Cortland

(*Continued from page* 430)

working place without his personal permission. Floaters didn't come to Cortland.

* * *

IN short, the situation at Cortland was that which labor theorists tell us has been lost through a combination of corporate overgrowth and managerial bungling. The owner is no longer in touch

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ONLY, greasy areas on floors endanger your employees. One effective way to eliminate this hazard is to spread Oakite Composition No. 71 over areas to be de-perilized. This highly absorbent, granulated material quickly soaks up slip-promoting oil, grease and water. Gives your employees sure footing for more sufficient production. "71" is economical, too.

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with his workers, say these pundits, and his hired drivers lack the temperament and the inducement to preserve the old relationships. Well, let's look at the record. In the past twenty five years at Cortland there has been no change in the management, which is also the ownership. There has been no change in the size of the plant. I hardly think there would be any support for the thesis that continuous drawing, straight line cleaning, and carbide dies have unduly exasperated the workers. And yet the wave of madness which swept over American labor some fifteen years ago didn't halt at the city limits of Cortland; it submerged the mill. Strikes have been frequent and violent, turnover is terrific, by old standards, and dissatisfaction ever seethes beneath the surface. There is probably a lesson here, for one who can read it.

* * *

WICKWIRE Bros. is not a large plant, 30,000 tons a year is the capacity, but with due regard to the size and degree of fabrication of the bulk of the product it is large indeed. There is in fact no other plant so highly integrated in which all operations are conducted inside one fence. Most plants of this size have had "puppies"; ambitious or dissatisfied floaters have started competing plants in the neighborhood. **Wickwire** has had a way of keeping its men, and has up to the present fathered no pups. It is true that a small mill was started at Homer, a Cortland neighbor, but so far as I know it was started not by Wickwire men but by townspeople who seem to have thought that the Wickwire Brothers had stumbled upon a way of life that was easy and profitable, and open to all. The enterprise ultimately passed into control of interests later absorbed into the **New York Wire Cloth Co.**

* * *

THERE is another enterprise which might, with a considerable stretch of the imagination, be considered a Wickwire off-shoot, though the connection is remote indeed. We shall discuss it in the next number.

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General and heat resisting alloy castings for wire mill use.
Circulars on Request.
E. J. SCUDDER FOUNDRY & MACHINE CO.
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Labor Relations

(*Continued from page 437*)

of themselves in any new federation.

* * *

KEY figure in the right-left puzzle is Lewis. He has been as outspoken against Communists in recent years as other AFL leaders but left wingers played a key roll in his great organizing drives of 1933 and 1937 and associates predict he will insist on a "hands off" policy in order to gain unity.

* * *

LABOR leaders here believe that the drive towards unity was tremendously spurred by the restrictive labor legislation in Congress but that now it has reached such strength that it will continue to grow after the current impetus has passed.

* * *

THIS trend towards unity has a very real meaning to wire and wire products manufacturers. Once the unification has been achieved, the bargaining power of all member unions will be substantially increased. The drive to organize will be intensified.

* * *

BUT most important, the pattern of labor relations will tend to become standarized. Industry leaders here are convinced that if smaller fabricators are going to succeed in detaching themselves from the tail end of such bargaining relations as exist for instance among fabricators in the steel industry, this detachment must take place before labor has set up its "organic unity", otherwise labor will be in a position to force the fabricators into big industry patterns such as the steelworkers insist upon.

* * *

IN the light of these facts the Detroit movement for fabricator independence and the holdout of many steel fabricators after "big steel" had settled with Murray take on new significance.

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forms round, flat or square wire to accurately duplicated shapes.
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British Take Steps to Resolve Labor Difficulties

THE wire and wire rope manufacturing industry in Great Britain has been subject, like all other British industries, to a disruption of prewar relationships between employer and employee. This came to a head last year when the industry found it impossible to accede to certain demands. Now a Court of Inquiry has been appointed by Mr. George Isaacs, Minister of Labour, to smooth out the differences.

* * *

A Ministry statement indicated that it had not yet been possible to secure general agreement between the parties concerned as to the steps to be taken to resolve the difficulties, which resulted in the serious stoppage of work in the industry in September and October of last year.

* * *

INCREASING pressure is being placed on the industry in Britain to enforce a 5-day working week, while at the same time, repeated demands for increased wages are being filed.

* * *

PRACTICALLY every industry is faced with this problem and some have already agreed to pacts which put such a policy into effect. Typical of this is the agreement between the **Constructional Engineering Federation** for workers engaged on constructional engineering contracts.

* * *

THESE workers are to have a 44-hour week. The 44 hours will be worked on five days (Monday through Friday) for nine months of the year and on 5-1/2 days (Monday to Saturday) for twelve weeks of the year, from mid-November to mid-February.

* * *

WAGES have also to be increased by 2d per hour as a result of the agreement. Outside workers (erectors, riverters, sheeters, crane-drivers, welders, etc.) and others whose work is outside

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* * *

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% WIRE AND WIRE PRODUCTS

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WIRE AND WIRE PRODUCTS

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by manufacturer.
Box 466 c/o Wire & Wire Products.

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WHERE TO BUY

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ABRASIVES—
Norton Co., Worcester, Mass.

ACID INHIBITORS—
American Chemical Paint Co., Ambler, Pa.
Oakite Products, Inc., New York, N. Y.
Parkin, Wm. M., Co., Pittsburgh, Pa.

ACID-PROOF CONSTRUCTION—
Ceilcote Co., The, Cleveland, Ohio.
Haveg Corporation, Newark, Del.
Sauereisen Cements Co., Pittsburgh, Pa.

AIR DRAW FURNACES
Carl-Mayer Corp., Cleveland, Ohio.

ALKALINE CLEANERS—
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Magnus Chemical Co., Garwood, N. J.
Oakite Products, Inc., New York, N. Y.

ANNEALING MACHINES—Open Flame
Syncro Machine Co., Perth Amboy, N. J.

ANNEALING POTS AND BOXES—
National Annealing Box Co., Washington, Penna.
Scudder, E. J., Foundry & Machine Co., Trenton, N. J

ARMORING EQUIPMENT—
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

BAKERS—Rod and Wire
Carl-Mayer Corp., The, Cleveland, Ohio.
Morgan Construction Co., Worcester, Mass.
Ross, J. O. Engr. Corp., New York, N. Y.

BENDERS—
O'Neil-Irwin Mfg. Co,. Minneapolis,. Minn.

BOBBINS—Braider & Wire Weaving
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Company, Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.

BORON CARBIDE
Norton Co., Worcester. Mass.

BRAKES—Pneumatic
Entwistle, Jas. L. Co., Pawtucket, R. I.

BRAKES & SHEARS—
O'Neil-Irwin Mfg. Co., Minneapolis, Minn..

BRICKS—Acid Proof
Keagler Brick Co., Steubenville, Ohio.

CABLE LACQUERING OVENS
Industrial Ovens, Inc., Cleveland, O.

CABLE—Steel and Copper
Jones & Laughlin Steel Corp., Pittsburgh, Pa.

CARRIERS—Braider, High Speed
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.
New England Butt Co., Providence, R. I.

CASTINGS—Wire Mill
Scudder, E. J. Fdry. & Mach. Co., Trenton, N.J.

CEMENTS—Acid Proof
Sauereisen Cements Co., Pittsburgh, Pa.
Ceilcote Co., The, Cleveland, Ohio.

CEMENTS—Refractory
Norton Co., Worcester, Mass.

CHEMICALS—Cleaning
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Magnus Chemical Co., Garwood, N. J.
Oakite Products, Inc., New York, N. Y.
Parkin, Wm. M., Co., Pittsburgh, Pa.
Standard Industrial Compounds Co., Chicago, Ill.

CLEANERS—Hand and Metal
American Chemical Paint Co., Ambler, Pa.
Magnus Chemical Co., Garwood, N. J.
Apex Alkali Products Co., Phila, Pa.
Oakite Products, Inc., New York, N. Y.
Standard Industrial Compounds Co., Chicago, Ill.

CLEANING & PICKLING EQUIP.—
Cleveland Tramrail Div., of the Cleveland Crane & Engineering Co., Wickliffe, O.
Haveg Corporation, Newark, Del.
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.
Wean Equipment Corp., Cleveland. Ohio.
Wilson, Lee. Engr. Co.. Cleveland. Ohio.

CLOTH TESTERS—
Scott Testers, Inc., Providence, R. I.

CLOTH—WIRE. All Metals
Reynolds Wire Co., Dixon, Ill.
Roebling's John A. Sons, Co., Trenton, N. J.

COATING COMPOUNDS—
Apex Alkali Products Co., Philadelphia, Pa.
Magnus Chemical Co., Garwood, N. J.
Miller, R. H., Co., Inc., Homer, N. Y.
Oakite Products, Inc., New York, N. Y.
Standard Industrial Compounds Co., Chicago, Ill.

COILERS—Sheet, Strip and Wire
Entwistle, Jas. L. Co., Pawtucket, R. I.
Morgan Construction Co., Worcester, Mass.
Ruesch, H. J. Machine Co., Newark, N. J.
Torrington Mfg. Co., Torrington, Conn.
Wean Equipment Corp., Cleveland, Ohio.

COLD HEADERS—
Waterbury-Farrel Foundry & Machinery Co., Waterbury, Conn.

COMPOUNDS—Coppering
American Chemical Paint Co., Ambler, Pa.

COMPOUNDS—Diamond
Engis Equipment Company, Chicago, Ill.

COMPOUNDS—Metal Finishing
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.

COMPOUNDS—Rust Preventing
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Magnus Chemical Co., Garwood, N. J.
Oakite Products, Inc., New York, N. Y.

COMPOUNDS—Rust Removing
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Phila, Pa.
Oakite Products, Inc., New York, N. Y.
Standard Industrial Compounds Co., Chicago, Ill.

COMPOUNDS—Wire Drawing
Apex Alkali Products Co., Phila., Pa.
Magnus Chemical Co., Garwood, N. J.
Miller, R. H. Co., Inc., Homer, N. Y.
Oakite Products, Inc., New York, N. Y.
Potter, Neil C., Newark, N. J.
Standard Industrial Compounds, Co., Chicago, Ill.

COPHOLDERS—Steel
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Company, Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.

CRANES—Wire Mill
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, O.
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

CUTTING TOOLS—Carbide
Carboloy Co., Inc., Detroit, Mich
Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
Vascoloy-Ramet Corp., North Chicago. Ill.

CUTTING TOOLS—Wire
Porter, H. K., Inc., Everett, Mass.

DIAMONDS—Industrial
Balloffet Dies & Nozzle Co., Inc., Guttenberg, N.J.
Champion Diamond Co., New York, N. Y.
Michigan Wire Die Co., Detroit, Mich.
Rusch Wire Die Corp., Croton-on-the-Hudson, N.Y.
Van Itallie Co., The, New York, N. Y.
Vianney Wire Die Wks., New York, N. Y.
Wayne Wire Die Co., Hillside, N. J.

DIAMOND POWDERS—
Champion Diamond Co., New York, N. Y.
Michigan Wire Die Co., Detroit, Mich.
New England Wire Die Co., Worcester, Mass.
Rusch Wire Die Corp., Croton-on-the-Hudson, N.Y.
Union Wire Die Corp., New York, N. Y.
Van Itallie Co., The, New York, N. Y.
Wayne Wire Die Co., Hillside, N. J.

DIAMOND TOOLS—
Rusch Wire Die Corp., Croton-on-the-Hudson, N.Y.
Wayne Wire Die Co., Hillside, N. J.

DIES—Diamond
Ajax Industrial Supplies, Inc., Fort Wayne, Ind.
Balloffet Dies & Nozzle Co., Inc., Guttenberg, N.J.
Cochaud Wire Die Corp., New York, N. Y.
Ft. Wayne Wire Die, Inc., Fort Wayne, Ind.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Michigan Wire Die Co., Detroit, Mich.
New England Wire Die Co., Worcester, Mass.
Rusch Wire Die Corp., Croton-on-the-Hudson, N.Y.
Union Wire Die Corp., New York, N. Y.
Vianney Wire Die Wks., New York, N. Y.
Wayne Wire Die Co., Hillside, N. J.

DIES—Lead Extrusion
Eastern Tungsten Carbide Co., Newark, N. J
Robertson, John, Co., Brooklyn, N. Y.
Wayne Wire Die Co., Hillside, N. J.

DIES—Repairs & Re-Cutting
Ajax Industrial Supplies Co., Fort Wayne, Ind.
Balloffet Dies & Nozzle Co., Inc., Guttenberg, N.J.
Carboloy Co., Inc., Detroit, Mich.
Cochaud Wire Die Corp., New York, N. Y.
Eastern Tungsten Carbide Co., Newark, N. J.
Firth-Sterling Steel & Carbide Corp., McKeesport, Pa.
Fit-All Tool & Die Co., Bronx, N. Y.
Ft. Wayne Wire Die, Inc., Fort Wayne, Ind.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corp., Youngstown, O.
Michigan Wire Die Co., Detroit, Mich.
New Eng. Wire Die Co., Worcester, Mass.
Rusch Wire Die Corp., Croton-on-the-Hudson, N.Y.
Union Wire Die Corp., New York, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.
Vianney Wire Die Wks., New York, N. Y.
Wayne Wire Die Co., Hillside, N. J.

DIES—Rod and Tube Drawing
Balloffet Dies & Nozzle Co., Inc., Guttenberg, N.J.
Carboloy Co., Inc., Detroit, Mich.
Eastern Tungsten Carbide Co., Newark, N. J
Firth-Sterling Steel & Carbide Corp., McKeesport, Pa.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corp., Youngstown, O.
Michigan Wire Die Works, Detroit, Mich.
Rusch Wire Die Corp., New York, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.
Vianney Wire Die Wks., New York, N. Y.

DIES—Tantalum Carbide
Balloffet Dies & Nozzle Co., Inc. Guttenburg N. J.
Carboloy Co., Inc., Detroit, Mich.
Firth-Sterling Steel & Carbide Corp., McKeesport, Pa.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corp., Youngstown, O.
Millbury Die Co., Millbury, Mass.
Rusch Wire Die Corp., Croton-on-the-Hudson, N.Y.
Vascoloy-Ramet Corp., North Chicago, Ill.
Vianney Wire Die Wks., New York, N. Y.

DIES—Tungsten Carbide
Balloffet Dies & Nozzle Co., Inc., Guttenburg, N.J.
Carboloy Co., Inc., Detroit, Mich.
Firth-Sterling Steel & Carbide Corp., McKeesport, Pa.
Fit-All Tool & Die Co., Bronx, N. Y.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corp., Youngstown, O.
Michigan Wire Die Co., Detroit, Mich.
Millbury Die Co., Millbury, Mass.
Rusch Wire Die Corp., Croton-on-the-Hudson, N.Y.
Tungsten Alloy Mfg. Co., Newark, N. J.
Vascoloy-Ramet Corp., North Chicago, Ill.
Vianney Wire Die Wks., New York, N. Y.
Wayne Wire Die Co., Hillside, N. J.

DIRECT ELECTRIC RESISTANCE HEATING—
Trauwood Engineering Co., The, Cleveland Ohio.

DRAW BENCHES—
Ruesch, H. J., Machine Co., Newark, N. J.
Scudder, E. J. Fdry. & Mach. Co., Trenton, N.J.
Vaughn Machinery Co., Cuyahoga Falls, O.

DRUMS—Flange Steel
Howsam Spool Co., Aurora, Ill.
Hubbard Spool Company, Chicago, Ill.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.

DRUMS—Vulcanizing
Mossberg Pressed Steel Corp., Attleboro, Mass.

DRYING & PRE-HEATING ROOMS—
Carl-Mayer Corp., Cleveland, Ohio.
Industrial Ovens, Inc., Cleveland, Ohio.

DRYING EQUIPMENT—
Carl-Mayer Corp., The, Cleveland, Ohio.
Ross, J. O. Engr. Corp., New York, N. Y.

ENGINEERS—Consulting Wire Mill
Lewis, Kenneth B., Worcester, Mass
Syer, C. Raymond, Westport, Conn.

EQUIPMENT—Insulation Testing
Davis, R. L. Electric Co., Wallingford, Conn.
Entwistle, James L., Co., Pawtucket, R. I

EYELETS—Brass or Zinc
Platt Bros., & Co., The, Waterbury, Conn.

FLUXES—Soldering
American Chemical Paint Co., Ambler, Pa.

FOAM PRODUCING COMPOUNDS—
American Chemical Paint Co., Ambler, Pa.
Parkin, Wm. M. Co., Pittsburgh, Pa.

FRICTION PAY-OFF STANDS—
Industrial Ovens, Inc., Cleveland, Ohio.

FURNACES—Annealing
Ajax Electric Co., Inc., Philadelphia, Pa.
Carl-Mayer Corp., The. Cleveland, Ohio.
Electric Furnace Co., Salem, Ohio.
Furnace Engrs. Inc., Pittsburgh, Pa.
Surface Combustion Corp., Toledo, Ohio.
Trauwood Engineering Co., The, Cleveland Ohio.
Wilson, Lee Engr. Co., Cleveland, Ohio

WHERE TO BUY, Continued

FURNACES—Automatic
Carl-Mayer Corp., The, Cleveland, Ohio.
Electric Furnace Co., Salem, Ohio.
Surface Combustion Corp., Toledo, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio.

FURNACES—Brazing
Electric Furnace Co., Salem, Ohio.
Firth-Sterling Steel & Carbide Corp., McKeesport, Pa.

FURNACES—Bright Annealing
Electric Furnace Co., Salem, Ohio.
Furnace Engineers, Inc., Pittsburgh, Pa.
Surface Combustion Corp., Toledo, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio.

FURNACES—Electric
Eisler Engineering Co., Newark, N. J.
Electric Furnace Co., Salem, Ohio.
Surface Combustion Corp., Toledo, Ohio.

FURNACES—Galvanizing Equipment
Ajax Electric Co., Inc., Philadelphia, Pa.
Electric Furnace Co., Salem, Ohio.
Furnace Engineers, Inc., Pittsburgh, Pa.
Sleeper & Hartley, Inc., Worcester, Mass.
Surface Combustion Corp., Toledo, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio.

FURNACES—Hard'ing & Temp'ing
Ajax Electric Co., Inc., Philadelphia, Pa.
Carl-Mayer Corp., The, Cleveland, Ohio.
Electric Furnace Co., Salem, Ohio.
Surface Combustion Corp., Toledo, Ohio.
Trauwood Engineering Co., The, Cleveland Ohio.

FURNACES—Lead Melting
Electric Furnace Co., Salem Ohio.
Furnace Engineers, Inc., Pittsburgh, Pa.
Robertson, John, Co., Brooklyn, N. Y.
Surface Combustion Corp., Toledo, Ohio.

FURNACES—Non-Oxidizing
Ajax Electric Co., Inc., Philadelphia, Pa.
Carl-Mayer Corp., The, Cleveland, Ohio.
Electric Furnace Co., Salem, Ohio.
Furnace Engineers, Inc., Pittsburgh, Pa.
Surface Combustion Corp., Toledo, Ohio.

FURNACES—Normalizing
Ajax Electric Co., Inc., Philadelphia, Pa.
Carl-Mayer Corp., The, Cleveland, Ohio.
Electric Furnace Co., Salem, Ohio.
Furnace Engineers, Inc., Pittsburgh, Pa.
Surface Combustion Corp., Toledo, Ohio.

FURNACES—Salt Bath
Ajax Electric Co., Inc., Philadelphia, Pa.
Electric Furnace Co., Salem, Ohio.
Surface Combustion Corporation, Toledo, O.

FURNACES—Wire, Strip & Sheet
Carl-Mayer Corp., The, Cleveland, Ohio.
Eisler Engineering Co., Newark, N. J.
Electric Furnace Co., Salem, Ohio.
Furnace Engineers, Inc., Pittsburgh, Pa.
Surface Combustion Corporation, Toledo, O.
Wilson, Lee, Engr. Co., Cleveland, Ohio.

GALVANIZING EQUIPMENT
Hanson, Van Wrinkle Munning Co., Matawan, N. J.

GALVANIZING KETTLES
National Annealing Box Co., Washington, Pa.

GRINDERS—Roll
Norton Co., Worcester, Mass.

HOISTS—Electric Travelling
Cleveland Tramrail Div. of Cleveland.
Crane & Engineering Co., Wickliffe, Ohio.

INHIBITORS—Pickling
American Chemical Paint Co., Ambler, Pa.
Oakite Products, Inc., New York, N. Y.
Parkin, Wm. M. Co., Pittsburgh, Pa.

INSULATING LACQUERING SYSTEMS—Continuous
Industrial Ovens, Inc., Cleveland, Ohio.

INSULATING MATERIALS—
General Electric Co., Schenectady, N. Y.
Owens-Corning Fiberglas Corp., Toledo, Ohio.
Standard Varnish Wks., Staten Island, N. Y.
Warren W., Thread Works, New York, N. Y.

KETTLES—Galvanizing, Annealing, Tinning, etc.
National Annealing Box Co., Washington, Penna.

LATHES—Die Reaming
Carboloy Co., Inc., Detroit, Mich.
Firth-Sterling Steel & Carbide Corp., McKeesport, Pa.
Morgan Construction Co., Worcester, Mass.
Roos, H. & G., Tool & Mfg. Co., Montclair, N.J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Machine Co., Waterbury, Conn.

LIME—
Warner & Co., Philadelphia & Bellefonte, Pa.

LININGS—Acid and Alkali Proof
Ceilcote Co., The, Cleveland, Ohio.
Haveg Corporation, Newark, Del.

LUBRICANTS—For Metal Cutting, Stamping and Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Magnus Chemical Co., Garwood, N. J.
Miller, R. H., Co., Inc., Homer, N. Y.
Oakite Products, Inc., New York, N. Y.
Standard Industrial Compounds Co., Chicago, Ill.

LUBRICANTS—Wire Drawing
Apex Alkali Products Co., Phila., Pa.
Magnus Chemical Co., Garwood, N. J.
Miller, R. H., Co., Homer, N. Y.
Oakite Products, Inc., New York, N. Y.
Potter, Neil C., Newark, N. J.
Standard Industrial Compounds Co., Chicago, Ill.

MACHINERY—Armoring (Cable, Wire Hose)
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Bale Tie
Reed and Richards Transatlantic, Inc., New York, N. Y.

MACHINERY—Braiding
Mossberg Pressed Steel Corp., Attleboro, Mass.
New England Butt Co., Providence, R. I.
Wire & Textile Mach'y, Inc., Pawtucket, R. I.

MACHINERY—Brazing
Syncro Machine Co., Perth Amboy, N. J.

MACHINERY—Bunching
American Insulating Mach'y Co., Phila, Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Bundling, Scrap
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Cable, Electric
American Insulating Mach'y Co., Phila, Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Cable, Rope Closing
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Coil Winding
Entwistle, Jas. L. Co., Pawtucket, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.

MACHINERY—Coilers
Eisler Engineering Co., Newark, N. J.
Entwistle, Jas. L. Co., Pawtucket, R. I.
Morgan Construction Co., Worcester, Mass.
New England Butt Co., Providence, R. I.
Ruesch, H. J. Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.
Waterbury Farrel Fdry. & Mach. Co., Waterbury, Conn.
Watson Machine Co., Paterson, N. J.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Copper Wire Drawing and Rolling
American Insulating Mach'y Co., Phila, Pa.
Ruesch, H. J., Machine Co., Newark, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Covering Wire
American Insulating Mach'y Co., Phila, Pa.
Royle, John & Sons, Paterson, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Cutting
Dore Manufacturing Co., Inc., Grayling, Mich.
Eisler Engineering Co., Newark, N. J.
Lewis Machine Co., The, Cleveland, Ohio.
National Mach'y Exch., (Used), New York, N.Y.
Porter, H. K. Inc., Everett, Mass.
Shuster, F. B. Mfg., Co., New Haven, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Die Making
Carboloy Co., Inc., Detroit, Mich.
Firth-Sterling Steel & Carbide Corp., McKeesport, Pa.
Roos, H. & G., Tool & Mfg. Co. Montclair, N.J.
Union Wire Die Co., New York, N. Y.
Wayne Wire Die Co., Hillside, N. J.

MACHINERY—Draw Benches
Morgan Construction Co., Worcester, Mass.
Ruesch, H. J., Machine Co., Newark, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Edging
Torrington Mfg. Co., Torrington, Conn.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Enameling
American Insulating Mach'y Co., Phila., Pa.
Industrial Ovens, Inc., Cleveland, O.
Syncro Machine Co., Perth Amboy, N. J.

MACHINERY—Extruding
National Erie Corp., Erie, Pa.
Robertson John, Co., Brooklyn, N. Y.
Royle, John, & Sons, Paterson, N. J.

MACHINERY—Fence
Glader, Wm. Machine Works, Chicago, Ill.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Filament Coil Winding
Eisler Engineering Co., Newark, N. J.

MACHINERY—Flat Wire
Ruesch, H. J., Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Forming
Eisler Engineering Co., Newark, N. J.
National Mach'y Exch. (Used), New York, N. Y.
O'Neil-Irwin Mfg. Co., Minneapolis, Minn.
Reed and Richard Transatlantic, Inc., New York, N. Y.
Seifert, E. R., Inc., Syracuse, N. Y.
Sleeper & Hartley, Inc, Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Galvanizing
Wilson, Lee, Engr. Co., Cleveland, Ohio.

MACHINERY—Galvanizing Wire
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.
Wean Equipment Corp., Cleveland, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio.

MACHINERY—Gang Winders
Entwistle, Jas. L. Co., Pawtucket, R. I.
Ruesch, H. J., Machine Co., Newark, N. J.
Syncro Machine Co, Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Grinding
Norton Co., Worcester, Mass.

MACHINERY—Insulating
American Insulating Mach'y Co., Phila, Pa.
National Erie Corp., Erie, Pa.
New England Butt Co., Providence, R. I.
Royle, John & Sons, Paterson, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Lead Encasing Presses, etc.
Robertson, John Co., Brooklyn, N. Y.

MACHINERY—Lead Stripping
Robertson, John Co., Brooklyn, N. Y.

MACHINERY—Lock Washer
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Magnet Wire
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Material Handling
Cleveland Tramrail, Div. of the Cleveland.
Crane & Engineering Co., Wickliffe, O.

MACHINERY—Measuring Wire & Cable
Durant Mfg. Co., Milwaukee, Wis.
Entwistle, Jas. L. Co., Pawtucket, R. I.
New England Butt Co., Providence, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Nail and Tack
Glader, Wm. Machine Works, Chicago, Ill.
National Mach'y Exch. (Used), New York, N.Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Panning
American Insulating Mach'y Co., Phila., Pa.
Syncro Machine Co., Perth Amboy, N. J.

WHERE TO BUY, Continued

MACHINERY—Pointing
Morgan Construction Co., Worcester, Mass.
Ruesch, H. J., Machine Co., Newark, N. J.
Scudder, E. J., Fdry. & Mach., Co., Trenton, N.J.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Foundry & Machinery Co., Waterbury, Conn.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Rod Mill
Morgan Construction Co., Worcester, Mass.
Ruesch, H. J., Machine Co., Newark, N. J.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Rolling Mill
Morgan Construction Co., Worcester, Mass.
National Mach'y Exch. (Used), New York, N.Y.
Ruesch, H. J., Machine Co., Newark, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.
Waterbury-Farrel Foundry & Machinery Co., Waterbury, Conn.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Rubber for Insulating Wire
Royle, John & Sons, Paterson, N. J.

MACHINERY—Rubber Tubing and Straining
New England Butt Co., Providence, R. I.
Royle, John & Sons, Paterson, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Screw Wire
National Mach'y Exch. (Used), New York, N. Y.
Sleeper & Hartley, Inc, Worcester, Mass.

MACHINERY—Special
American Insulating Mach'y Co., Phila, Pa.
Emory, Robert J., Co., Newark, N. J.
Entwistle, Jas. L. Co., Pawtucket, R. I.
National Erie Corp., Erie, Pa.
National Rubber Machinery Co., Akron, Ohio.
New England Butt Co., Providence, R. I.
Ruesch, H. J., Machine Co., Newark, N. J
Scudder, E. J., Fdry. & Mach., Co., Trenton, N.J.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.
Watson Machine Co., Paterson, N. J.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Spooling
American Insulating Mach'y Co., Phila., Pa.
Boyd, Charles P., Corp., Philadelphia, Pa.
Eisler Engineering Co., Newark, N. J.
Emory, Robert J., Co., Newark, N. J.
Entwistle, Jas. L. Co., Pawtucket, R. I.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N .J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Foundry & Machinery Co., Waterbury, Conn.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc., Pawtucket, R. I.

MACHINERY—Spring Making
National Mach'y Exch. (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Staple
Reed and Richards Transatlantic, Inc., New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Straightening
Dore Manufacturing Co., Inc., Grayling, Mich.
Lewis Machine Co., The, Cleveland, Ohio.
National Mach'y Exch. (Used), New York, N. Y.
Ruesch, H. J., Machine Co., Newark, N. J
Shuster, F. B., Mfg. Co., New Haven, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Stranding
Huhgesville Machine & Tool Co., Hughesville, Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Strip Steel
Ruesch, H. J., Machine Co., Newark, N. J.
Torrington Mfg. Co., Torrington, Conn.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Swaging
National Mach'y Exch. (Used), New York, N. Y.
Ruesch, H. J., Machine Co., Newark, N. J
Sleeper & Hartley Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N .J.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Taping
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Syncro Machine Co., Perth Amboy, N .J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Testing Equipment—Sparkers
Entwistle, Jas. L., Pawtucket, R. I.

MACHINERY—Tinsel Rolling Mills
American Insulating Mach'y Co., Phila., Pa.
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Trolley Wire
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Tube Mill
National Erie Corp., Erie, Pa.
Ruesch, H. J., Machine Co., Newark, N. J.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Welding Wire
Eisler Engineering Co., Newark, N. J.
Micro Products Co., Chicago, Ill.
Syncro Machine Co., Perth Amboy, N. J.

MACHINERY—Winding
American Insulating Mach'y Co., Phila., Pa.
Eisler Engineering Co., Newark, N. J.
New England Butt Co., Providence, R. I.
Sleeper & Hartley Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wind-up (Constant Tension, Variable Speed)
Industrial Ovens, Inc., Cleveland, O.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wire Bending
Eisler Engineering Co., Newark, N. J.
O'Neil-Irwin Mfg. Co., Minneapolis, Minn.

MACHINERY—Wire Drawing
American Insulating Mach'y Co., Phila, Pa.
Eisler Engineering Co., Newark, N. J.
Morgan Construction Co., Worcester, Mass.
National Mach'y Exch. (Used), New York, N. Y.
Ruesch, H. J., Machine Co., Newark, N. J.
Scudder, E. J., Fdry. & Mach., Co., Trenton, N.J.
Sleeper & Hartley, Inc, Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Wire Rope
New England Butt Co., Providence, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J .

MACHINERY—Wire Tinning
American Insulating Mach'y Co., Phila, Pa.
New England Butt Co., Providence, R. I.
Syncro Machine Co., Perth Amboy, N. J.

MACHINERY—Wood Screw
National Mach'y Exch. (Used), New York, N. Y.

MATERIAL HANDLING EQUIPMENT
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, O.

MILLS—Tandem Rolling and Edging
Torrington Mfg. Co., Torrington, Conn.

NAILS—Wire
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Keystone Steel & Wire Co., Peoria, Ill.

NICKEL SILVER AND PHOSPHOR BRONZE—Rod, Wire and Strip
Hudson Wire Co., Ossining, N. Y.

OILS—Wire Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Miller, R. H., Co., Inc., Homer, N. Y.
Oakite Products, Inc., New York, N. Y.
Standard Industrial Compounds Co., Chicago, Ill.

OVENS—Cable Lacquering
American Insulating Mach'y Co., Phila., Pa.
Industrial Ovens, Inc., Cleveland, Ohio.

OVENS—Dehydrogenizing
Carl-Mayer Corp., The, Cleveland, Ohio.
Industrial Ovens, Inc., Cleveland, Ohio.

OVENS—Industrial
Carl-Mayer Corp., The, Cleveland, Ohio.
Industrial Ovens, Inc., Cleveland, Ohio.
Ross, J. O. Engr. Corp., N. Y., N. Y.

OVENS—Welding Rod Coating
Carl-Mayer Corp., The, Cleveland, Ohio.
Industrial Ovens, Inc., Cleveland, Ohio.
Ross, J. O., Engr. Corp., New York, N. Y.

PAINTS—Heat Resisting
American Chemical Paint Co., Ambler, Pa.

PAINTS—Marine
American Chemical Paint Co., Ambler, Pa.

PAINTS—Structural Steel
American Chemical Paint Co., Ambler, Pa.

PANS—Lead and Spelter
National Annealing Box Co., Washington, Penna.

PANS—Vulcanizing
Mossberg Pressed Steel Corp., Attleboro, Mass.

PAPER—Creped Wrapping
Crepe-Kraft Co., Newark, N. J.

PAPER—For Coil Wrapping and Corrosion Prevention
Crepe-Kraft Co., Newark, N. J.

PAPER TESTERS—
Scott Testers, Inc., Providence, R. I.

PATENT ATTORNEYS—
Lancaster, Allwine and Rommel, Washington, D.C.

PICKLING COMPOUNDS—
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Phila., Pa.
Oakite Products, Inc., New York, N. Y.
Parkin, Wm. M., Co., Pittsburgh, Pa.

PICKLING TANK LININGS—
Ceilcote Co., The, Cleveland, Ohio.
Sauereisen Cements Co., Pittsburgh, Pa.
Haveg Corporation, Newark, Del.

PIPES & FITTINGS—Acid Resistant
Ceilcote, Co., The, Cleveland, Ohio.
Haveg Corporation, Newark, Del.

PLASTIC TESTERS—
Scott Testers, Inc., Providence, R. I.

POTS—Lacquer
Industrial Ovens, Inc., Cleveland, Ohio.

POTS—Lead Melting
National Annealing Box Co, Washington, Pa.
Robertson, John, Co., Brooklyn, N. Y.

POWDER—Wire Drawing
Apex Alkali Products Co,. Phila, Pa.
Magnus Chemical Co., Garwood, N. J.
Miller, R. H., Co., Inc., Homer, N. Y
Potter, Neil C., Newark, N. J.
Standard Industrial Compounds Co., Chicago, Ill.

PRESSES—Hydraulic and Mechanical
Robertson, John, Co., Brooklyn, N. Y.

PRESSES—Lead
Robertson, John, Co., Brooklyn, N. Y.

PRESSURE VESSELS—
National Annealing Box Co., Washington, Penna.

PULLERS—Wire
Scudder, E. J., Fdry. & Mach., Co., Trenton, N.J.
Sleeper & Hartley, Inc, Worcester, Mass.

PUMPS—Hydraulic
Robertson, John, Co., Brooklyn, N. Y.

REELS—Annealing and Stranding
Howsam Spool Co., Aurora, Ill.

REEL AND TENSION STAND—
Industrial Ovens, Inc., Cleveland, Ohio.
Sleeper & Hartley, Inc, Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

REEL CRUTCHES—
Watson Machine Co., Paterson, N. J.

REELS—Annealing and Stranding
Apco Mossberg Co., Attleboro, Mass.
Howsam Spool Co., Aurora, Ill.
Hubbard Spool Company, Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.

REELS—Collapsible
Entwistle, Jas. L. Co., Pawtucket, R. I.

REELS—Steel
Apco Mossberg Co., Attleboro, Mass.
Hayward, R. B. Co., Chicago, Ill.
Howsam Spool Co., Aurora, Ill.
Hubbard Spool Company, Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.

WHERE TO BUY, Continued

REELS AND SPOOLS—Shipping and Shop
Apco Mossberg Co., Attleboro, Mass.
Bridge Manufacturing Co., Hazardville, Conn.
Hayward, R. B. Co., Chicago, Ill.
Howsam Spool Company, Aurora, Ill.
Hubbard Spool Company, Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.

REELS—Takeoff
Apco Mossberg Co., Attleboro, Mass.
Hayward, R. B. Co., Chicago, Ill.
Howsam Spool Co., Aurora, Ill.
Hubbard Spool Company, Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Shuster, F. B., Mfg. Co., New Haven, Conn.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.

REELS—Vulcanizing & Impregnating
Apco Mossberg Co., Attleboro, Mass.
Hayward, R. B. Co., Chicago, Ill.
Howsam Spool Company, Aurora, Ill.
Hubbard Spool Company, Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.

REELS—Wire Drawing
Apco Mossberg Co., Attleboro, Mass.
Hayward, R. B. Co., Chicago, Ill.
Howsam Spool Company, Aurora, Ill.
Hubbard Spool Company, Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Niles Steel Products Div. Republic Steel Corp., Niles, Ohio.

REELS—Wooden
Bridge Mfg. Co., The, Hazardville, Conn.

REFRACTORIES—High Temperature
Norton Company, Worcester, Mass.

ROD BAKERS—
Carl-Mayer Corp., The, Cleveland, Ohio.
Ross, J. O. Engr. Corp., New York, N. Y.

RODS—Nickel Alloy
International Nickel Co., Inc., New York, N. Y.

RODS—Wire—Non-Ferrous
Hudson Wire Co., Ossining, N. Y.
Platt Bros. & Co., The, Waterbury, Conn.

RODS—Wire—Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Indiana.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
Roebling's John A., Sons Co., Trenton, N. J.
Youngstown Sheet & Tube Co., Youngstown, O.

ROPE—Wire
Bethlehem Steel Co., Bethlehem, Pa.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Roebling's, John A., Sons Co., Trenton, N. J.

RUBBER AND RUBBER COMPRESSION TESTERS—
Scott Testers, Inc., Providence, R. I.

RUST PROOF COMPOUNDS—
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Oakite Products, Inc., New York, N. Y.

RUST REMOVING COMPOUNDS—
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Standard Industrial Compounds Co., Chicago, Ill.

SATURATION SYSTEMS
Industrial Ovens, Inc., Cleveland, Ohio.
Watson Machine Co., Paterson, N. J.

SHEARS—
O'Neil-Irwin Mfg. Co., Minneapolis, Minn.

SHEET—Steel
Continental Steel Corp., Kokomo, Ind.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Youngstown Sheet & Tube Co., Youngstown, O.

SOAPS—Industrial and Wire Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Miller, R. H. Co., Inc., Homer, N. Y.
Potter, Neil C., Newark, N. J.
Standard Industrial Compounds Co., Chicago, Ill.

SOLVENT RESIN SYSTEMS—Experimental
Industrial Ovens, Inc., Cleveland, Ohio.

SPOOLS—Annealing and Wire Drawing
Apco Mossberg Co., Attleboro, Mass.
Hayward, R. B. Co., Chicago, Ill.
Howsam Spool Company, Aurora, Ill.
Hubbard Spool Company, Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.

SPOOLS—Shipping and Shop
Apco Mossberg Co., Attleboro, Mass.
Hayward, R. B. Co., Chicago, Ill.
Howsam Spool Company, Aurora, Ill.
Hubbard Spool Company,. Chicago, Ill
Mossberg Pressed Steel Corp., Attleboro, Mass
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.

SPOOLS—Steel
Apco Mossberg Co., Attleboro, Mass.
Hayward, R. B. Co., Chicago, Ill.
Howsam Spool Co., Aurora, Ill.
Hubbard Spool Company, Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.

SPRINGS—Tools for Forming
State Machine Tool Co., Hartford, Conn.

STAMPINGS—Steel
Hubbard Spool Company, Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.

STRIP—Brass and Non-Ferrous
Hudson Wire Co., Ossining, N. Y.

STRIP—Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Firth-Sterling Steel & Carbide Corp., McKeesport, Pa.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Roebling's, John A., Sons Co., Trenton, N. J.
Youngstown Sheet & Tube Co., Youngstown, O.

SWIFTS—Take-off
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Watson Machine Co., Paterson, N. J.

TANK LININGS—Brick
Ceilcote Co., The, Cleveland, Ohio.
Keagler Brick Co., Steubenville, Ohio.

TANK—Compound
Haveg Corporation, Newark, Del.
Watson Machine Co., Paterson, N. J.

TANKS—Pickling
Ceilcote Co., The, Cleveland, Ohio.
Haveg Corporation, Newark, Del.
Sauereisen Cements Co., Pittsburgh, Pa.

TANKS—Steel
Mossberg Pressed Steel Corp., Attleboro, Mass.
National Annealing Box Co., Washington, Penna.

TOOLS—Wire Cutting
Porter H. K., Inc., Everett, Mass.

TRAMRAIL SYSTEMS—
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, O.

TRAVERSES—For Reels
Entwistle, James L. Co., Pawtucket, R. I.
Hubbard Spool Company, Chicago, Ill.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.

TRAVERSE MECHANISMS—
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

TREADS—Safety
Norton Co, Worcester, Mass.

TUBE BENDERS AND FORMERS—
Ruesch, H. J. Machine Co., Newark, N. J.

VALVES & FITTINGS—Acid Resistant
Haveg Corporation, Newark, Del.

VARNISHES—For Insulation
Standard Varnish Wks., Staten Island, N. Y.

VULCANIZERS—
Watson Machine Co., Paterson, N. J.

VULCANIZING PANS—
American Insulating Mach'y Co., Phila., Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.

WELDERS—Spot and Butt
Eisler Engineering Co., Newark, N. J.
Micro Products Co., Chicago, Ill.

WIND-UP AND UNWIND SYSTEMS—Continuous
American Insulating Mach'y Co., Phila, Pa.
Entwistle, James L. Co., Pawtucket, R. I.
Industrial Ovens, Inc., Cleveland, O.
Watson Machine Co., Paterson, N. J.

WIRE—Aluminum
Aluminum Co. of America, Pittsburgh, Pa
Malin & Co., Cleveland, Ohio.

WIRE—Cast
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Cold Heading
Bethlehem Steel Co., Bethlehem, Pa.
Columbia Steel Co., San Francisco, Calif.
Continental Steel Corp., Kokomo, Ind.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
Roebling's John A., Sons Co., Trenton, N. J.
Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.
U. S. Steel Export Co., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O

WIRE—Electric
Hudson Wire Co., Ossining, N. Y.
Malin & Co., Cleveland, Ohio.

WIRE—Enameled for Coils
North American Philips Corp., New York, N. Y.
Winsted Div. of Hudson Wire Co., Winsted, Conn.

WIRE—Manufacturers
American Steel & Wire Co., Cleveland-Chicago-New York.
Bethlehem Steel Co., Bethlehem, Pa.
Columbia Steel Co., San Francisco, Calif.
Continental Steel Corp., Kokomo, Ind.
Firth-Sterling Steel & Carbide Corp., McKeesport, Pa.
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
Reynolds Wire Co., Dixon, Ill.
Roebling's, John A., Sons Co., Trenton, N. J.
Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.
U. S. Steel Export Co., New York, N. Y.
Wickwire Bros., Cortland, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Music
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Malin & Co., Cleveland, Ohio.

WIRE—Nickel & Nickel Alloy
International Nickel Co., Inc., New York, N. Y.

WIRE—Nickel Silver and Phosphor Bronze
Hudson Wire Co., Ossining, N. Y.
Malin & Co., Cleveland, Ohio.

WIRE—Non-Ferrous to Specification for Special Purposes
Anchor Wire Corp., Jamaica, N. Y.
Hudson Wire Co., Ossining, N. Y.
Winsted Div. of Hudson Wire Co., Winsted Conn.

WIRE—Spring
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Indiana.
Firth-Sterling Steel & Carbide Corp., McKeesport, Pa.
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Stainless Steel
American Steel & Wire Co., Cleveland-Chicago-New York.
Firth-Sterling Steel & Carbide Corp., McKeesport, Pa.

WIRE—Steel—Also Coppered Steel—Also Galvanized Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Firth-Sterling Steel & Carbide Corp., McKeesport, Pa.
Johnson Steel & Wire Co., Inc., Worcester, Mass
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
Youngstown Sheet & Tube Co., Youngstown, O

WIRE—Zinc
Platt Bros. & Co., The, Waterbury, Conn.

WIRE CLOTH—Industrial
Roebling's John A., Sons Co., Trenton, N. J.
Reynolds Wire Co., Dixon, Ill.

WIRE TESTERS—
Scott Testers, Inc., Providence, R. I.

WIRE, WEAVING—Non-Ferrous
Hudson Wire Co., Ossining, N. Y.
Reynolds Wire Co., Dixon, Ill.

WRAPPING PAPER—Creped
Crepe-Kraft Co., Newark, N. J.

YARNS & TAPES
Generala Electric Co., Schenectady, N. Y.
Owens-Corning Fiberglas Corp., Toledo, Ohio
Warren W., Thread Works, New York, N. Y.

YARN TESTERS—
Scott Testers, Inc., Providence, R. I.

The WATSON MACHINE COMPANY

ESTABLISHED 1845

PATERSON 3, NEW JERSEY, U. S. A.

Wire and Wire Products

June, 1947

ELECTRICAL WIRE AND CABLE AND WIRE ROPE MACHINERY

TAKEUPS — TYPE "DC"

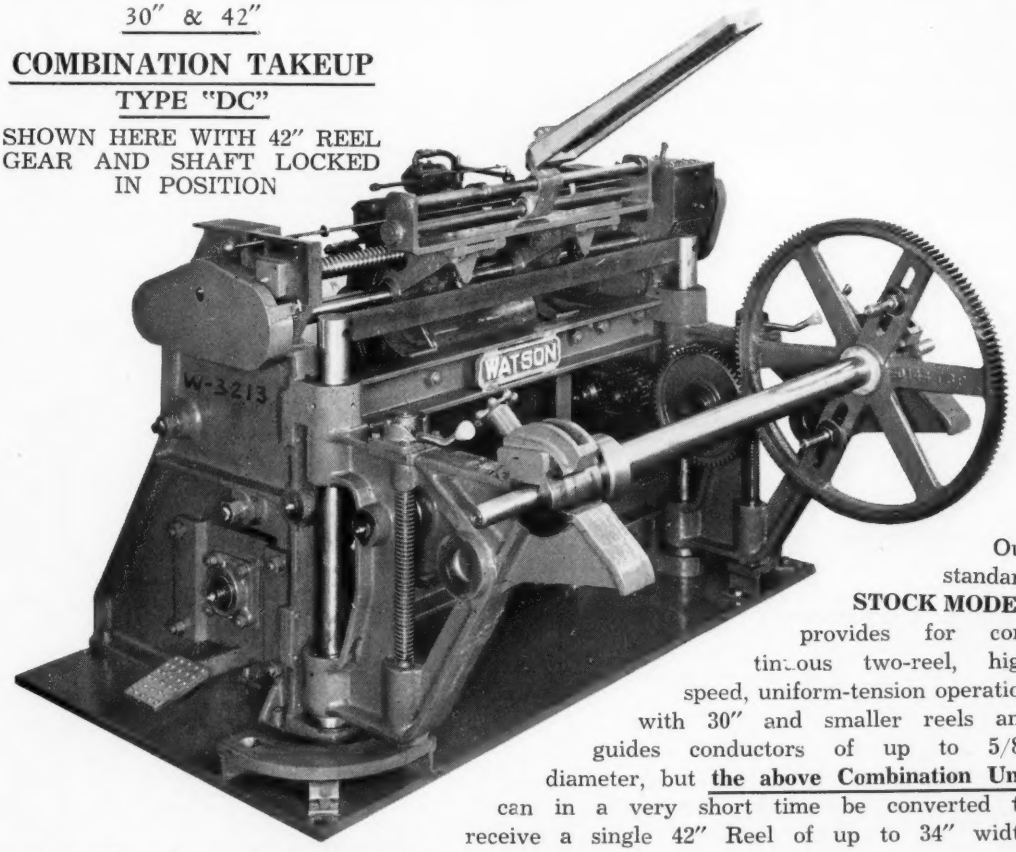
Aside from performance, which is well and widely known, one of the **outstanding advantages** of our "DC" Takeups is that they can be readily adapted to meet a variety of requirements of which the unit shown here is an example:—

30" & 42"

COMBINATION TAKEUP

TYPE "DC"

SHOWN HERE WITH 42" REEL GEAR AND SHAFT LOCKED IN POSITION



Our standard **STOCK MODEL** provides for continuous two-reel, high speed, uniform-tension operation with 30" and smaller reels and guides conductors of up to 5/8" diameter, but **the above Combination Unit** can in a very short time be converted to receive a single 42" Reel of up to 34" width and to effect this conversion it is but necessary to:—

1. — Remove both small reel spindles.
2. — Lock Traverse Guide in central position.
3. — Insert Reel Gear Shaft in 42" Reel Cylinder Locks.

Thus converted, the traverse lay range rises automatically and the Takeup becomes suitable for the uniform-tension winding of conductors up to 1" diameter.

APPLICATIONS.

This Combination Unit is most generally supplied in connection with extrusion processes where variety is the rule and the equipment must provide for a wide range i. e. small diameter high-speed and large diameter low-speed runs. Also used in Saturating and other "continuous or long-run" processes and serves as a single takeup in other fields where a uniform light product tension is desirable.

36" Continuous Takeups also available

Prospective users please request machine bulletin

EF

GAS FIRED,
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. . . . . feature many exclusive advantages

● EF furnaces will give you the utmost in efficiency and economy, and reflect the advantage of many service-proved features—conceived and perfected by EF engineers—and available only in EF design. These include the EF radiant tube and EF heat exchanger, which combine to assure extremely high combustion efficiency; EF heavy, cast alloy electric heating elements, EF roller design and mounting, EF special atmosphere generators and many other devices that assure uniform temperature throughout the furnace, accurate control of heat within the required limits, low maintenance, high hourly outputs, and uniform, low cost, dependable operation.

Let EF engineers with their long and outstandingly successful experience work with you on your next heat treating job!

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THE ELECTRIC FURNACE CO.

WILSON ST. AT PENNA. R.R.

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FOR ANY PROCESS, PRODUCT OR PRODUCTION

Salem-Ohio